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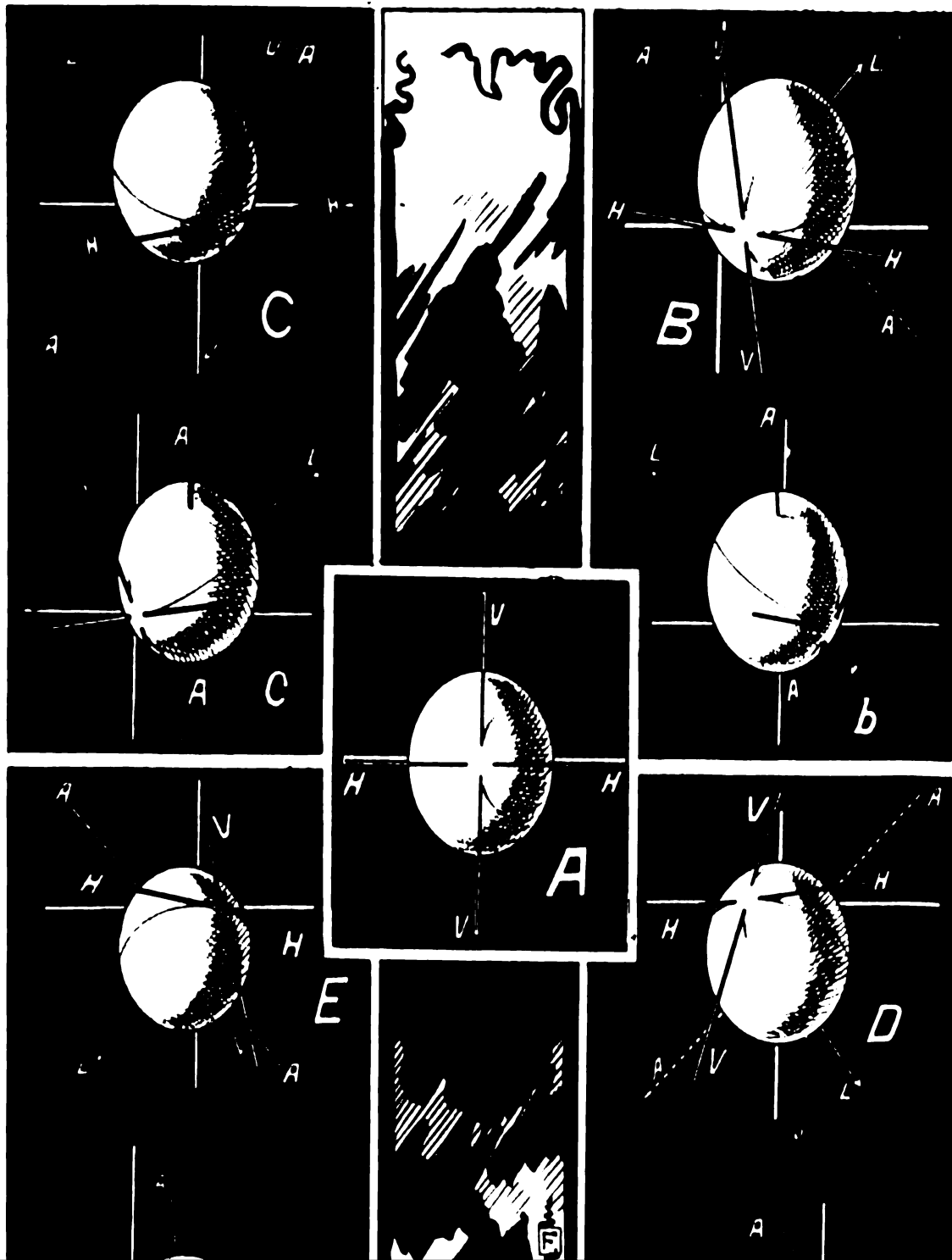
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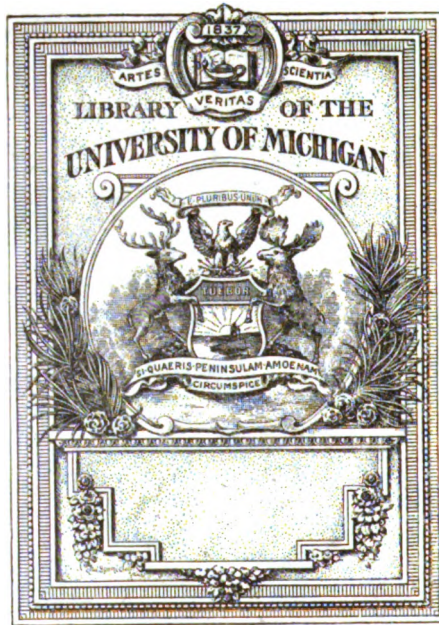
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James Pleasant Parker





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ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY

JANUARY, 1895.

CORNEAL OPACITIES. CLINICAL STUDY OF CASES TREATED BY DIFFERENT METHODS.

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THE cases reported in this paper are not to show the superiority of any one method of treatment. They are typical ones, and illustrate different methods of treating such cases, the results obtained, and the length of time taken to get these results. Fuch, in his text-book, refers to Adler as recommending electricity for the removal of corneal opacities. The method used by him is to place two small metallic buttons, one of which is attached to the positive, and the other to the negative pole of a battery. This is spoken of as a very severe measure, attended with a great deal of pain.

The method used in the treatment of the cases reported here, is one devised by Dr. Alleman, and reported by him in the *Brooklyn Medical Journal*. A small silver electrode, with concave contact surface, in which a globule of mercury is made to adhere (this for a surer contact rather than any medical virtue), is attached to negative pole: the ordinary sponge electrode to temple is positive. The strength of current used is $\frac{1}{4}$ to $\frac{1}{2}$ milliampere; the time of contact one minute, rarely longer.

Pressure inunction is the name given to a method of treatment advised by Dr. Ryerson, of Toronto, and reported by him in a paper published in *Archives Ophthal.*, vol. XX.

The first case reported, is one treated with electricity alone: opacities of recent development.

The second, treated first with pressure inunctions and yellow oxid of mercury ointment, then with electricity; opacities present a year.

The third, treated with yellow oxid of mercury ointment, then with electricity; opacities of thirty years standing.

The fourth, treated with pressure injections alone; opacities—some of them recent, and some of long standing.

The fifth, treated with yellow oxid of mercury ointment alone; opacities of several months' duration.

The first case I shall report rather fully, as the history prior to corneal opacities is an interesting one:

Case I. Mr. L. H., 30 years of age, occupation, book-keeper. Was first seen on October 29, 1887. History of granular ophthalmia when a child. Palpebral conjunctiva scarred, and shows characteristic appearance left by old trachomatous inflammation; no sign of present trachoma. The cornea slightly hazy; vision, R. E., $\frac{5}{30}$; L. E., $\frac{5}{35}$. Iris normal; lens and vitreous clear; optic nerve, retina and choroid normal. Dacryocystitis present in right, and partial occlusion of left lachrymal duct. The strictures were divided; dacryocystitis treated. Glasses were given: R. E., cyl. — 1 ax. $170^\circ = \frac{5}{8}$; L. E., cyl. — 2 ax. $40^\circ = \frac{5}{8}$. Patient reported occasionally for treatment of lachrymal trouble, until September 20, 1891. At this date he presented himself with right eye very much inflamed and painful; general health poor. There was found at upper and outer margin of cornea a narrow linear ulceration; L. E. normal. The ulceration was curetted and touched with carbolic acid and dressed antiseptically. General treatment given. There was no noticeable discharge from lachrymal sac. This was, however, thoroughly washed out with solution of bichlorid during the whole period of trouble. The following day the ulceration had extended very perceptibly. The floor and walls of the ulceration were cauterized with galvano-cautery, but in spite of repeated cauterization the destructive process crept around entire cornea (annular ulcer). The island of clear cornea then began to grow hazy and show signs of sloughing. This entire area of diseased tissue was thoroughly cauterized. This put a stop to the destructive process, new tissue beginning to fill in. The same ulcerative condition now began in the left eye, the ulcerative process creeping along the margin of the cornea for about half its circumference. The use of cautery in this eye checked its further progress. The ulcerative condition extended from below, well up towards pupillary area. After healing process was complete in both eyes, a thick central opacity, extending well on to margin of cornea, was noticeable on right eye. Vision = count fingers. Vision, L. E., = $\frac{4}{60}$. The use of electricity was now commenced. Cornea anesthetized with cocain; current of $\frac{1}{4}$ M. A. used for one minute every other day, and then every day. Vision on February 12, 1892, = $\frac{6}{35}$ each eye. Electricity was applied at intervals until July 25, 1892. The ophthalmometer at this date showed a corneal astigmatism of .6 D. ax 90° in right eye, and 3 D. ax. 90° in left eye. The eyes were then tested for glasses, and lenses prescribed as follows; R. E., cyl. — 4.50, ax. $180^\circ = \frac{6}{15}$. L. E., sph. — 1.75 \ominus cyl. — 3, ax. $130^\circ = \frac{6}{15}$; near vision reads Jag. No. 2 at 30 cm. The gentleman was able to return to his duties as book-keeper.

The increase in corneal astigmatism and the change in axis is interesting.

Case II. Mrs. W., 26 years of age. First seen on November 6, 1893. Had recently come to this country from England where she had been under

treatment for interstitial keratitis. Inherited syphilitic taint; vision, R. E. = $\frac{1}{80}$ by turning head to one side. L. E., amblyopic, = light perception; eye strongly divergent. This had been present since childhood. Pupils dilated well under mydriatic. Patient sent to hospital. Pressure inunctions and the ointment of yellow oxid of mercury used in eyes once a day, the nurse performing thorough massage of cornea through closed eyelid. This treatment continued for three weeks. Vision, R. E., = $\frac{2}{80}$. Treatment by electricity was now commenced; $\frac{1}{2}$ M. A. for one minute; clearing of cornea quite rapid; treatment only possible at intervals of a week or more, as patient left hospital. Vision, April 18, 1894, = $\frac{6}{80}$.

Case III. Mr. John C., 36 years of age. Seen first on March 14, 1894. History of inflammation of eyes in childhood. Central leucoma, right eye; vision, R. E., = $\frac{6}{80}$; L. E., = count fingers. The lens, vitreous, nerve, and retina, normal in right eye. The left has lenticula opacity. Ung. hydrarg. oxid flav. prescribed; to be used once a day. This treatment continued for three months; vision, R. E., = $\frac{6}{80}$. Treatment continued until July, 1894, vision = $\frac{6}{80}$. Electricity now used, $\frac{1}{2}$ M. A. one minute every other day. October 7, 1894, vision = $\frac{6}{80}$; no perceptible improvement; in fact, a decided loss of vision during treatment by electricity.

Case IV. Miss Miriam K., 23 years of age. First seen on November 1, 1893. Suffering with kerato-iritis. Family history poor. Has had repeated attacks of inflammation of eyes. When seen by me there was profuse lachrymation, and photophobia; cornea hazy and infiltrated; iritis, numerous posterior synechia. Patient sent to hospital; hot applications, constitutional treatment, atropin, ordered. The anterior chamber of right eye very deep; tension inclined to be plus; paracentesis of chamber performed; pain relieved. Subconjunctival injection of solution bichlorid mercury. Injections every fourth day. Inflammation rapidly disappeared. Vision, R. E., December 9, 1893, = $\frac{6}{80}$. Sees objects with left eye. Pressure inunctions used. (The following formula is the one used by Dr. Ryerson: Calomel, gr. iii Ung. lanolin and vaselin, of each four drachms mix. Small piece put in conjunctival sac, and large quantity smeared over closed eyelids; gauze and absorbent cotton compress and fairly tight bandage over all; allowed to remain one hour twice a day.) This treatment continued until January 2, 1894, when she was discharged from hospital with vision in R. E. of $\frac{6}{80}$; L. E., $\frac{6}{80}$. The ophthalmometer showed a corneal astigmatism of 3 D. ax. 75, R. E.; 3 D. ax. 105, L. E. Glasses were prescribed which gave vision as follows: R. E., cyl. + 2.25, ax. 120 = $\frac{6}{80}$; L. E., sph. + 1.50 \odot cyl. + 2.50, ax. 120 = $\frac{6}{80}$. Patient directed to continue pressure inunctions. Returned on August 18, 1894; corneal astigmatism as shown by ophthalmometer, R. E., 1 D. ax. 15; L. E., 5 D. ax. 120, a decided lessening in corneal astigmatism; very little to be seen of corneal opacities. Glasses given as follows: R. E., cyl. + 1, ax. 10 = $\frac{6}{80}$; L. E., cyl. + 5.50, ax. 160 = $\frac{6}{80}$. The change in corneal astigmatism as the cornea cleared is interesting.

Case V. Master S. S., 3 years of age. First seen in 1888; brought to office by family physician. General health good; intense photophobia present; ulceration of left cornea at upper and outer quadrant found. This was treated in the usual way. When healing process was complete a thick cicatrix extended down on to pupillary area. The family physician was

instructed to have the yellow oxid of mercury ointment used. I was afterwards informed that the parents, being unable to manage the child, brought him to the physician's office nearly every day for a period of nearly three years, where the ointment was thoroughly applied. Child brought to me again on October 12, 1894. The corneal opacity had all disappeared from pupillary area, small white leucoma at site of old ulceration; vision, R. E., = $\frac{3}{8}$; L. E., = $\frac{1}{5}$. Ophthalmometer showed corneal astigmatism of 1.50, ax. 90°, R. E.; 3 D., ax. 15°, L. E. Child complained of headache and pain in eyes; unable to see clearly, particularly at school. Eyes put under the influence of atropin. Glasses were prescribed as follows: R. E., cyl. + .75, ax. 90° = $\frac{3}{8}$; L. E., cyl. + 2, ax. 180° = $\frac{3}{8}$.

Where improvement is found from the use of electricity, does this improvement come from a real electrolysis of the opaque tissue, or from the direct irritation of the cornea caused by the stimulus of the current directly applied? I am inclined to think the last explanation the true one. I am quite sure there is some electrolytic action, but do not think it has any action in clearing the tissue. The electrolysis is noticeable on surface of clear cornea if the current is too strong, or if the electrode is allowed to remain too long in one spot. There is then a distinct break in superficial corneal layer. The vision in case III was decidedly worse after using electricity. This might be explained by electrolytic action of current on superficial layers of cornea which, when it was reformed, might be somewhat hazy. The treatment by this method seems to be adapted to all varieties of corneal opacity, though it is not equally successful in its results with all, any more than any other one form of treatment. The method by pressure inunction would seem best adapted to opacities produced by inflammatory deposit, interstitial and superficial keratitis. There is no one method of treatment that is applicable to all cases. The best results in the majority of cases are obtained from the judicious varying of methods. The cornea, in time, it would seem, becomes tolerant to different irritants. In most recent cases it is best to commence with the milder forms of treatment, as the pressure inunctions, then yellow oxid of mercury, or combining the pressure inunctions with the oxid first, and then electricity. The last has the advantage of its being possible to accurately control it.

SOME REMARKS ON SKIASCOPY OR THE SHADOW TEST.

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THE many names given to this method of refraction has had much to do, no doubt with keeping skiascopy in the background of ophthalmology, instead of giving it the prominence which it more justly deserves.

Nettleship, Noyes and others would criticise skiascopy, because "we see nothing and think nothing of the condition of the fundus." This criticism being based apparently on the name (retinoscopy) rather than from any great amount of practical experience with the method.

Skiascopy (also scioscopy) Greek skia = shadow, and skopia = view, literally, "viewing the shadow" appears to be the best name, though not "*per se*" correct, as it is not a shadow that is seen, but a small illuminated area with surrounding darkness, more or less intense. (See Figs. A, B).

While admitting that the ophthalmoscope in front of a well trained eye can often make a close refractive record, yet only to the few does such skill obtain, and even then there is that uncertainty, which does not attach itself to the skiascope in competent hands.

With an eye, otherwise normal except for its optical correction, and being under the influence of a reliable mydriatic, there is no more accurate method of obtaining its exact correction, than by the shadow-test. The shadow-test is to the refractive media of the eye what the ophthalmometer of Javal is to the cornea. The skiascope: Two forms of plane mirror are in use. A. The large mirror, four centimeters in diameter, with sight hole four or five millimeters in diameter, often cut through the glass.

B. The small mirror,¹ two centimeters in diameter, (on a four centimeter metal disc) with sight hole not cut through the glass, the quicksilver or plating alone being removed. The glass at the

¹Philadelphia Polyclinic for November, 1893: "A modified skiascope by Dr. J. Thorington."

sight hole giving additional reflecting surface. (Figs. 1 and 2).

The large mirror is of use when refracting at a greater distance than one meter, and the small mirror by doing away with the super-abundance of light as produced by the large instrument is as small a reflecting surface as can be used to advantage at one meter distance. Reference to Fig. 1 shows this mirror full size, with reflection of central light area over the sight hole, as it comes from the opening in cover-chimney and as seen by the patient.

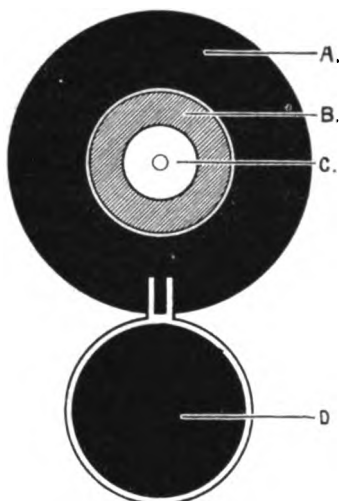


FIG. 1

Showing central light area C on small mirror B. A—Metal disc. D—Folding cap handle to protect B when not in use.

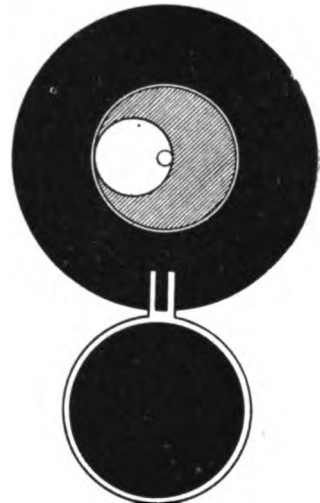


FIG. 2

Showing central light area passed to its limit for purposes of examination.

It is only while the sight hole is in this light area that the observer can get a good reflex from the eye under examination. Fig. 2 shows the mirror with light area passed to its limit for purposes of examination: if beyond this point, the observer loses the light reflex, thus showing the advantage of the small mirror, and also the necessity for a very restricted movement and not the vigorous one so many give it. (See XI b, page 10.)

The cover chimney, as suggested by Jackson is made of metal (sheet iron), and to fit easily over the glass chimney of the Argand burner, dimensions, nineteen centimeters high, and in circumference, with round opening, twelve millimeters in diameter, six centimeters from lower edge.

As an improvement over this I have had made by Messrs Reimold & Meister of this city, an asbestos chimney of same dimensions;

claiming two advantages. 1. A draft of air may strike the asbestos with impunity, as it does not chill and cause a break of the inner glass chimney, the broken glass cutting the mantle of the Welsbach, as has happened repeatedly with the writer in the use of the metal chimney, thus putting an end to further examinations until repairs were made. 2. The lower part of the asbestos does not get so warm, but that it may be removed without burning the fingers, if it is desired to use the same light for purposes other than skiascopy.

Having used the skiascope almost daily for the past two years at both the Philadelphia polyclinic and Wills' Eye Hospital, and in his own private work with the utmost satisfaction, the writer would offer the following suggestions to those who may experience some of the difficulties that are constantly seen confronting students in

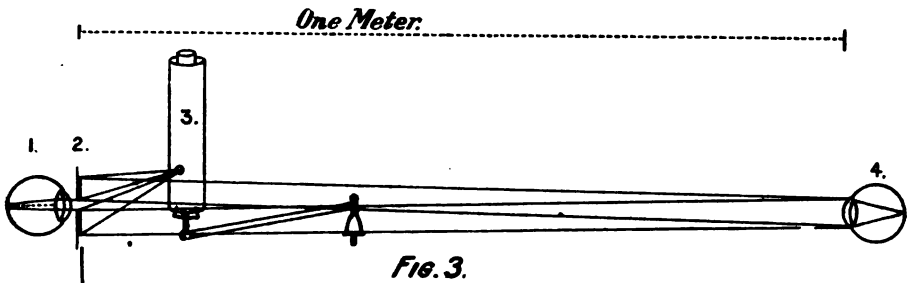


Fig. 3.
One meter distance between observer's (1) and observed eye (4). 2—Plane mirror
(See Figs. 1 and 2). 3—Cover-chimney with opening. (For purposes
of drawing, light has been placed above level of eyes).

acquiring this method of refraction, and as accuracy depends on a careful attention to details, these hints may not be untimely.

Of the two methods of skiascopy:

First, with the large concave mirror and source of light above patient's head, and

Second, with small plane mirror and source of light from a twelve millimeter opening in a cover-chimney, close to observer's eye: obtaining point of reversal at one meter: the latter is the method referred to in the following remarks:

I. The room should be darkened, the darker the better, and all sources of light, except the one in use, excluded. (See No. VI, page 8).

II. The patient to be seated comfortably in front of the observer at one meter distance² and have his eyes on as near a straight line with the opening in cover-chimney and mirror as possible. (Fig. 3).

²Shadow-test by Jackson, *vide* De Sweinitz, Diseases of the Eye.

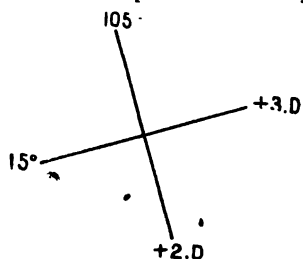
III. The light³ must be steady, clear and white, the Welsbach possessing all these qualities. The Argand burner is good, but care must be taken not to have the flame too high, or a blue light will occupy the opening in cover-chimney, and a dim reflection from mirror be the result.

IV. The source of light to be five or six inches to the left and front of the observer, the rays from opening in chimney falling on the mirrors in front of the observer's right eye, the left eye being in darkness and away from any of the light rays. This will save the observer great annoyance.

V. The trial frame is to be comfortably and accurately adjusted. The temples to rest easily on the ears. The nose piece (bridge) to be of sufficient length to permit the eye pieces to fit accurately over any pair of eyes (especially in children), and have the cornea occupy the center of the eye-piece. Correct results cannot be expected, unless the correcting lenses be placed with their centers corresponding to corneal centers and at the same time perpendicular to the front of the eye.

VI. Annoying reflexes, catoptric images, etc., are the result of poorly placed frames or lenses, turning of patient's head, other sources of light, etc. (See No. I).

VII. Neutralizing lenses, some use sphericals alone, while others use sphericals and cylinders, when the latter are called for by the presence of astigmatism. Advantage being claimed for both methods. With the following: At one meter the 105° meridian is corrected by a + 2 D., a + 3 D. correcting the 15° meridian, the difference in strength of the two sphericals giving the strength of the cylinder, in this instance a + 1



cylinder. This method of correcting with sphericals has been found much more satisfactory than by placing the + 2 D. as called for above, and then adding and changing cylinders until the correct one is found, and each time taking care to get the cylinder axis just right, which is so difficult in the dark room. During this examination the patient is to gaze at the observer's forehead just above his eye; in this way the patient avoids the strain of looking straight at the bright reflected light, and at the same time the macular region is refracted. It is customary to cover the patient's other eye, and thus keep it at rest as much as possible.

³ Electric light with ground glass covering is meeting with favor.

1777. The central shadow, the stumbling block to so many, and on the recognition of which so much depends, is best demonstrated in a dark room by reflecting rays through a strong plus lens (13 D.) and observing the focal point on a light surface; it is this focal point which corresponds to and is the central shadow as seen in looking into the center of the pupil, as the correcting lens approaches the exact refraction, the mirror being moved even so slightly. (See Figs. A and B).



A. Central shadow. B. Central shadow to one side by tilting mirror. C. Band of light, astigmatism, axis 75 degrees. D. Scissor-movement and small central shadow.

IX. The band of light is an elongation of the central shadow; Fig. C., and is also shown in dark room by reflecting rays through a high plus cylinder (+ 6 D. cyl.), onto a white surface. This light band is only present in astigmatic eyes, and always gives the axis for the cylinders, and hence, is the meridian of least ametropia. In eyes with mixed astigmatism there are two bands of light, each seen separately at opposite axes, the one moving with, and the other against the movement of the light on the face.

X. The scissor-movement is not infrequent, and is generally seen on the horizontal meridian, or within a few degrees of 180°. When present it will be recognized by two narrow bands of light approaching each other from above and below, toward the center of the pupil, Fig. D. The movement of these bands has been likened to the opening and closing of a pair of scissors, and hence the name. Accompanying this movement, and in the shaded interspace between the bands, is often seen the small central shadow. While the double band of light (scissor-movement) is not on the meridian of least ametropia, yet it is in these cases that we continue to use the meridian of the bands as the axis for our cylinder, namely with the following formula: + 1.50 D. \odot + 0.50 cyl. ax. 90, substitute a spherical the strength of the combined values of the spherical and cylinder, and use a minus cylinder of same number as the plus at the opposite axis, the result would be + 2 D. \odot - 0.50 cyl. ax. 180: the vision with this latter formula is much better in many instances than with the former. Either of these prescriptions would be correct, but the latter + 2 D. \odot - 0.50 cyl. horizontal is practically the better of the two, and should be ordered when so found. Cases of scissor-movement, that the writer

has had opportunity to examine, the ophthalmometer of Javal has failed to note any corneal error, thus giving the supposition that the astigmatism must be lenticular. If this be the correct solution of the scissor-movement, then surely it is in these cases that the shadow-test stands supreme and excels both the ophthalmometer and ophthalmoscope; the former not being able to find the astigmatism, and the latter, while detecting, cannot locate it.

XV. Movement of the mirror. There are times when a quick or rapid movement, and at other times a slow or gradual movement is required; a substitution of one for the other, a quick when a slow movement should be made and "*vice versa*," the result cannot be correct.

(*a*). The quick movement is generally necessary when looking into an eye before any correcting lens has been placed "*in situ*." It tells the character of the refraction.

(*b*). The slow movement comes into use when the eye has been corrected to within the 0.75 of a diopter or less, and it is generally at this point that so many stop and believe they have gotten as near to the result as the mirror can bring them. With a simple hyperopia of + 1.50 D. (or + 2.50 D. in dark room), the beginner or careless observer by a quick movement of the mirror will say at once that "a + 2.50 D. over corrects," whereas the accurate observer by moving the mirror very slowly will take note of the small central shadow which just moves with the mirror. See Fig. B, page 9.

The reason for this failure of the quick movement to detect the central shadow is, that the peripheral rays were noted, and hastened so that the central shadow was obscured. The central shadow should always be looked for carefully, and when once noted, there is no reason why the skiascopist should not refract each eye to its exact correction to the 0.12 of a diopter.

XVI. The point of reversal. This is difficult to determine. It is easy to tell when the shadow moves with or against the light on the face, but to get the exact point where there is no movement is not easy.

Having determined at one meter that the shadow with a + 1.50 D. just moves with the light on the face and against with a + 1.75 D., we know that the reversal point must be between the two or at + 1.62 D. This demonstrates how we arrive at the exact correction, and also the capability and accuracy of the shadow-test.

The method of obtaining the point of the reversal at points other than the regulation one meter, requires such an amount of extra measuring and computing that it does not meet with the general favor and satisfaction accorded to that found by producing an artificial myopia of one diopter.

1630 Arch Street.

THE HALO, OR RAINBOW SYMPTOM IN GLAUCOMA.

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THIS is more of a theoretical paper than a practical one. Theory is important for the interpretation of facts, but is worth little unless it can explain its own phenomena, and it must effect this without contradicting itself; accordingly the facts are sometimes made to suit the theory, rather than the theory the facts; and is acceptable on the whole, more for its plausibility than for its solidity. Darwin once advanced a theory in which he informed us that the reason why the bosom of a beautiful woman was an object of such peculiar delight, arises from the fact that all our first pleasurable sensations of warmth, sustenance and repose, are derived from that source. This theory had a fair run, until someone happened to reply that all who were brought up by hand and derived their first pleasurable sensations from a very different source, and as yet, not one of all these had ever been known to evince any very rapturous or amatory emotions at the sight of a wooden spoon or gum nipple.

Several theories have been evolved as to the cause of the rainbow, or colored rings of light which appear in glaucoma, principally by older authors, none by our modern writers, who simply refer to it as an existing fact, but do not explain its cause. The general inference being, that it is due to the increased tension, but its *modus operandi* is disputed.

It is spoken of as a prodromal symptom of glaucoma, which is an error, inasmuch as it may occur at any stage of glaucoma, *prior to the destruction of the cornea* from excessive inflammation. The impression probably originated before the differentiation between glaucoma inflammatorum, and glaucoma simplex, the latter not being recognized as glaucoma, but simply as a disease where there was increased tension with excavation of the optic nerve, without

inflammation and was considered a prodromal stage. It is in the first stage of glaucoma inflammatorum that the patient usually refers to the rainbow symptom.

The character of the symptom is described in text-books principally as a rainbow or ring of colored light, when the visual axes are directed toward a lamp or bright light. Not constant, appearing and disappearing during the course of the disease, regardless of the tension, *after it has once existed*, whether it be increased or temporarily decreased. Some books speak of shimmerings, or flying sparks of light in connection with it, but these are simply subjective symptoms due to muscæ volitantes, or retinal irritation, and should not be mentioned in connection with the halo symptom, except as a co-existing symptom; they are not pathognomonic of glaucoma, inasmuch as they exist in other conditions regardless of tension, and are not dependent on it.

I take the liberty to quote at length from a recent article on this subject, by Dr. S. O. Richey, of Washington, D. C., appearing in the July number of the ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY, in which he says that "the cause of the halo would seem not to be in the retina itself, but in the media anterior to it. Its variability suggests the aqueous humor, or some surface subject to the influence of the aqueous humor, for it is in the *serum* of the blood that the chief deviation from the healthy standard is perceived, by the products of excretion which have not been eliminated. When the urates in the blood are in excess (uric acidemia), the same influences which determine their presence in the synovial fluid of the joints and their precipitation upon the serous surfaces operate in the eye which is more exposed to vicissitudes of temperature. Hence, variations of glaucoma halo, with variations of urates in the blood, might clearly occur without present change of intra-ocular tension," and claims these urates to exist in the form of "sodic chlorid combined with uric acid which forms shining rhombic prisms, and that the halo is produced by the reflection of rays of light on these urates." Having for his argument, the lunar halo, which according to the accepted theory, (Descartes) is owing to the refraction and reflection of rays of light by minute snow and ice crystals in the upper strata of air, and occurs in the presence of the cirrus, or ice-cloud, as an analogy. And further says that the transposition of colors, which are reversed in glaucoma, the red being on the outer margin instead of the inner margin, is "strong evidence that the cause of the glaucoma halo is to be looked for posterior to the iris, in accordance with the disposition of rays of

light passing through the aperture of a screen." If this be so, and the reversal of colors in the glaucoma halo be due to transposition, then the colors in the rainbow after a shower, which is anterior to the iris the same as the lunar halo, would be transposed also, and should be arranged the same as in the lunar halo; red on the inner margin, but it is not. It is red on the outer margin the same as the glaucoma halo, making it evident that the cause of the glaucoma halo is anterior to the iris exclusively, and makes the theory of the transposition of the former doubtful. According to the disposition of rays of light passing through an aperture in a screen, there is an inversion, the object is in an inverted one but no color or detail of it is transposed, a simple inversion of a circle or halo would make no perceptible change in its appearance, the colors retaining the same position as they did prior to the inversion. If it were due to the non-eliminated excretions from the serum of the blood, then its appearance would naturally be expected at any time in any disease of the eye where tension does not take part, and confined to people of rheumatic or gouty diathesis, which it is not. If it were due to precipitated urates on the retina, then we would expect to find some deposits with the ophthalmoscope which we do not. In *synchysis scintillans* we have particles of cholesterol in the vitreous which are distinctly discernible as bright, glistening crystals, but produce no halo. The rainbow symptom does not exist except where there is, or has been increased tension, not moderate tension, but sufficient to interfere with the circulation and produce edema, tension which if not relieved, will ultimately destroy the eye. Tension produced artificially by pressure on the eye by the fingers produces a narrow ring of white light with a black center opposite to the points of pressure *but no color*. Great abnormal pressure such as we find in glaucoma, and which exists in no other disease or condition, leaves nothing but excessive tension, to which the production of the halo can be attributed and the presence of intra-ocular contents, be they urates or what not, must be excluded as a causative factor. Tension then, as the prime factor, its effect as the immediate cause, gives us ample clinical condition upon which to base its production. Some three years ago, during an operative course on pig's eyes, I noticed when putting the eye in the mask and screwing it down to get as near the normal tension as possible, that with increased pressure I had a glaucomatous eye to all intents and appearances. I do not refer to the tension of the sclerotic, but to the appearance and condition of the cornea which assumed at once the peculiar smoky

reflex characteristic of glaucoma. That this was not due to the forced approximation of the lens to the cornea on account of the pressure being made posterior to the equator, was afterward demonstrated. When the pressure is removed the reflex disappears, and the pupil becomes black again. That this reflex, sometimes wrongly spoken of as opacity, is due to the pressure forcing the natural fluids the eye may have acquired (from the slight disintegration of the tissues after enucleation) through and into the lamellæ of the cornea is obvious, and that this is possible or probable is patent when we look at the cornea histologically, and that the same thing exists in glaucoma is demonstrated by Fuch under the head of the "Anatomy of the Cornea of Glaucoma" in which he says, in the cornea the cloudiness is found to be edema. The most anterior of the lamellæ of the corneal stroma are pushed apart by fluid. *But the fluid is especially apt to be found under the form of minute drops between Bowman's membrane and the epithelium.*

We have here a demonstrated pathologic anatomical condition, which coincides and is demonstrated by natural laws in the production of the rainbow, during a shower consisting of all the prismatic colors, their production depending, as is well known, on a double refraction and a single reflection of the sun's rays on drops of water. The vividness of its colors is increased or decreased in ratio to the finer or coarser division of the said drops, often occurring as a complete circle in the spray arising from cascades or fountains. We have here then two identical conditions, with identical results its non or disappearance in the glaucomatous eye based on the same laws as for its non or disappearance in the atmosphere, these beads of water being especially apt to be formed between Bowman's membrane and the epithelium layer of the cornea, explains how we may have its appearance in the eye at either high or low tension. Once the eye has been subjected to intra-ocular tension to the degree of interfering with the circulation sufficiently to produce stasis and edema of the cornea, a sudden diminution of the tension, would not immediately relieve the edema of the cornea any more than the recovery of the heart of its former tone, or increased compensation, would cause the sudden or immediate disappearance of anasarca. So while the cause is removed the same conditions exist for some time after, and we have the halo during an interval of comparatively low tension. On the other hand its disappearance during enormously high tension is readily explained by the naturally increased edema,

causing a coalescence of these edematous beads of water forming a zone of liquid under the epithelium layer, which is finally lifted up in small blebs, destroying the proper relation of the parts for refraction, without which the colors cannot be produced as on a sheet of water there is nothing but a reflection.

To recapitulate: 1. There is no transposition of colors in the rainbow.

2. If the play of colors were due to the non-eliminated excretions of the blood, then we should have the symptom in other diseases of the eye in which tension is not a factor.

3. If it were due to deposits³ of urates on the retina, then at some time deposits should be discernible with the ophthalmoscope, which they are not.

4. It is, in my opinion, dependent on stasis and edema of cornea, the varying distinctness of said symptom, dependent on the varying stages of edema.

5. Its appearance in comparatively low tension being dependent on the non-absorption of the resulting edema of the cornea, from a previously high tension.

6. Its non or disappearance in enormously high tension is dependent on the naturally increased edema, causing a coalescence of the edematous beads of water under the epithelial layer, thus destroying the proper relation for refraction, without which the colors cannot be produced.

7. Intra-ocular contents must be excluded as a causative factor.

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TREATMENT OF TRAUMATIC CATARACT ATTENDED BY RAPID SWELLING OF THE LENS

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THERE are many cases of traumatic cataract attended by rapid increase of intra-ocular tension, peri-corneal injection, and ultimate excavation of the optic nerve head, in which the foreign body either lodges in the lens or is withdrawn at the time of the accident. It is concerning such cases that I desire to speak. For years the practice of the profession has been to rely on the use of atropin if the symptoms be not severe, and to perform linear extraction if they be acute. This operation, linear extraction, is unscientific. Performed for the purpose of relieving undue tension evacuating the lenticular fragments, the very nature of the operation has been such as to diminish the first only temporarily and

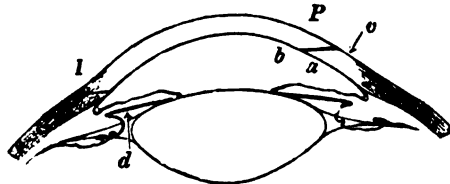


Fig. 1.—Diagram showing site of corneal wound in linear extraction. The line between b and the arrow indicates the direction of the incision in linear extraction; I, shows site of incision in my cases of traumatic cataract treated by extraction. (Fuchs).

defeat the second frequently. The situation of the corneal incision has been such as to preclude the possibility of removing all the fragments of the swollen lens. The oblique course of the wound¹ has rendered its potency impossible while favoring its closure. Furthermore, the incision made by the ordinary keratome was too short. That such objections are not chimerical can be seen readily by a study of the accompanying diagram :

In the cornea we find that flap wounds gap more than linear ones ; but the tendency toward gaping depends more upon whether the wound traverses the cornea perpendicularly or obliquely. The

former is more particularly the case in wounds made with the Graefe knife, in which the knife passes through the cornea from within outwards, while the latter condition exists when the lance-knife is used. These wounds do not gap because the instrument passes obliquely through the cornea and the lips of the wound close like a valve. This closure is caused by intra-ocular pressure. This force presses as strongly against the posterior lip (*a*) of the wound as upon the anterior lip (*b*). The wound must be made to gap before the softened lens matter can escape. Gaping of the wound can be produced not by the application of force opposite the site of the corneal incision, but only by pressure applied just peripheral to the wound (at *c* in Fig. 1). You can readily imagine that such a wound will not permit the removal of the diseased mass; in fact, only the softest portion of the lens can be evacuated, and irrigation of the anterior chamber is out of the question. Such are the objections to an operation which has the sanction of authority and the prestige of age.

The proposition which I desire to advance is this: In cases of traumatic cataract, with rapid swelling of the lens, an operation should be performed; and that operation should be, not linear extraction as has been the rule heretofore, but an extraction made with the Graefe knife, the incision being located in the corneoscleral junction. The knife should cut from one-third to two-fifths of the corneal circumference, according to the extent to which the softening process in the lens has advanced. If glaucomatous symptoms supervene, with softening of only a small part of the lens, as in case I, which I shall presently report, the corneal incision should be large; if the softening involve the whole lens the incision should be of less extent. The extent of the incision of the cornea is of little importance provided we make an aseptic operation. The chief merit of the operation which I advocate lies in the avoidance of the valve which we saw produced by the linear method; in other words, my method in these cases permits the free evacuation of all the lenticular substance with the least amount of traumatism. An iridectomy is not made. All the debris is moved at once. This cannot be accomplished by the linear method. In support of the proposition I desire to report two cases:

Case I. Traumatic Cataract; Extraction of Lens; Successful Result.—J. H., boy, 9 years of age, was struck in the eye by a needle, which pierced the cornea near its center and entered the lens. Opacity of the lens developed gradually, the lens's substance protruding through the puncture into

the anterior chamber, forming a rounded mass with a well-defined pedicle. Four days before consulting me inflammation developed; the eye became hard and painful. A careful examination under atropin and oblique illumination showed the condition described above.

Here was a case in which the classical operation for traumatic cataract—viz. linear extraction—was evidently out of place. Much of the lens was not softened; nevertheless, the eye showed increased tension, and this, unless soon relieved, would destroy vision. Since it was evident that the greater portion of the lens could not be removed by the linear method, I immediately made an extraction, passing a Graefe knife at the apparent corneo-scleral junction and severing about two-fifths of the circumference of the cornea. The lens was then extracted through a natural pupil. The eye dressed antiseptically, and the dressing kept constantly moist with a solution of bichlorid (1 to 300). Healing followed rapidly, and at the end of sixteen days the boy's vision in the affected eye equalled $\frac{1}{8}$.

Case II.—Traumatic Cataract; Extraction; Great Loss of Vitreous; Successful Result.—A few weeks after the discharge of Case I, another boy, 11 years of age, was brought to me with the statement that the thorn from some kind of a "creeper" had injured the eye a few weeks previously. Examination showed a congested conjunctiva, a faint corneal opacity marking the point of injury, dilated vessels in the peri-corneal zone, the anterior chamber almost obliterated by the pressure of a swollen lens, and great increase of intra-ocular tension. The eye had been painful for three days; At the time of the accident, and for several weeks following there was no pain.

This was a case of linear extraction, and yet I was sure that much of the lens was still unsoftened and could be removed by the linear operation only with great difficulty if at all. Consequently, I again used a Graefe knife, great care being taken lest the knife pierce the iris and cut out a section of that diaphragm. The section was made as in the previous case, with this difference, that the line of the incision was about one millimeter in advance of that in Case I. The greater part of the lens was softened and followed the knife. I was gently pressing with the cataract-spoon opposite the incision and working out some fragments of cortical matter, when suddenly there was a gush of vitreous. Immediately the protruding vitreous was cut off with scissors, only to be followed by more and more vitreous. The speculum was removed, the lids gently but firmly closed, and an antiseptic dressing applied. The next morning the lips of the wound were found to be approximated, the anterior chamber restored, and the conjunctival cul-de-sac filled with small floating particles of vitreous. The case progressed favorably and at the end of the fifteenth day the child's vision equalled $\frac{1}{8}$.

The loss of vitreous in Case II was due to the fact that the pupil was greatly dilated by atropin. If atropin had not been used I feel that there would have been no loss of vitreous. An iris with a pupillary opening of normal size forms a cap or covering to the vitreous and helps to retain that humor within the globe. Consequently the loss of vitreous in Case II should not be urged as an argument against this method of treating traumatic cataract. The

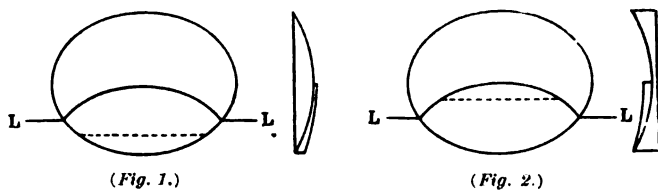
successful issue of two cases of traumatic cataract with inflammatory symptoms, treated in a manner not described in our text-books, leads me to believe that the commonly accepted treatment (linear extraction) is a mistake. I believe that an extraction through a large wound made by the Graefe knife, thus permitting the removal of all softened or semi-softened lens matter, will give better results than linear extraction.

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A PROBLEM IN CEMENTED BI-FOCAL LENSES. SOLVED BY THE PRISM-DIOPTER.

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IT is intended here to illustrate the principal defect which so frequently leads to disappointment in the use of cemented bi-focal lenses, as well as to explain the technical means by which it may be prevented. When occasion demands, it is common practice among oculists to prescribe glasses for "reading" and "distance," with rather vague instructions to the optician to provide the necessary lenticular corrections in the form of bi-focal lenses. These, in the event of their being of the so-called "perfection" variety, the optician executes by cementing wafers of glass to the surfaces of the lenses which fit the areas enclosed by the eye-wire; both of the wafers being cut from the peripheral edges of that lens which produces the requisite amplifying or reducing power in the lenticular combination. The principal effort of the optician, at present, is to make this lens as thin as

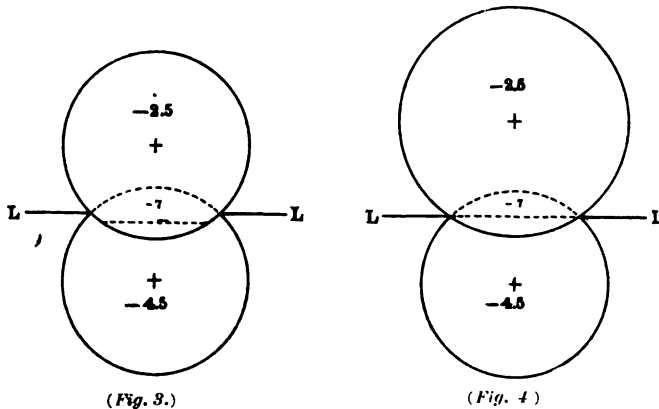


possible, and to reduce its diameter so as to enable him to secure at least two wafers of sufficient size for the ocular fields required.

Economy and extreme thinness of wafer are doubtless desirable, but these are only of minor importance. Spectacles as now constructed, exclusively with this in view, are rarely ever free from a prismatic action, operating vertically, which renders them very uncomfortable to wear, and frequently useless, or harmful. This is especially true for high degrees of curvature, *and in cases involving combination with cylinders*, where the spherical refraction is obtained by spherical curvature of *one* surface only. With a view to brevity, only the latter type of correction will be discussed.

The accompanying diagrams will serve to illustrate the defect referred to:

In figures 1 and 2 the lines L—L are drawn on paper, placed several inches behind the bi-focal sphero-cylindrical lens. The line viewed through the cemented lens appears disconnected, being deflected by the prismatic action resulting from decentration of the "distance" and "reading" lenses, relatively to each other. It is, of course, customary to have the lower smaller field for reading, as above shown, but, for convenience of easier demonstration, the reader may make the interesting experiment of superposing two concave lenses, say 4.5 D. and 2.5 D., on which the optical centers have been previously marked with ink dots, and allowing them to occupy the positions shown in Fig. 3, in which the overlapping parts would be the smaller field for distance.



(Fig. 3.)

(Fig. 4.)

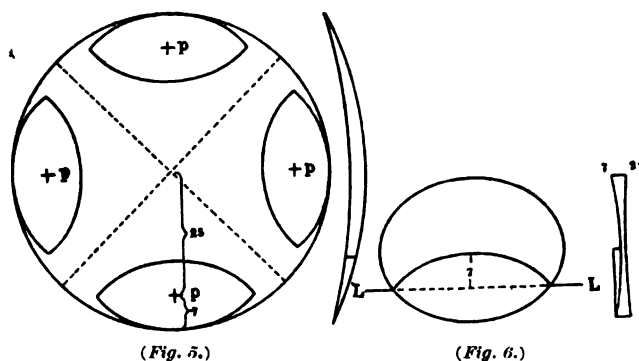
By more widely separating the lens centers, it will be observed that the disconnected portion of the line LL, as seen through the lenses, will appear displaced to a lesser degree, and, if the upper concave lens 2.5 D. is chosen of sufficient diameter, it will be possible to secure a distance between the lens-centers which will exhibit the line LL. unbroken, as in Fig. 4. This shows that the prismatic action depends only upon the distance separating the lens-centers, and therefore also that *the lens*, specifically in this case the upper one, from which the segmental wafers should be cut, *must have a definite diameter for every combination*, if the prismatic action is to be eliminated. We will cite an example in which we have for distance: 7 — 2 cyl. 180, and for reading: 4.5 — 2 cyl. 180, which, executed as a cemented bi-focal lens, calls for a - 2.5 periscopic wafer. This leads us to the proposition: WHAT PERIPHERAL SEGMENT OF A 2.5 D. PERISCOPIIC CONVEX LENS SHOULD BE USED AS A WAFER TO INSURE FREEDOM

FROM PRISMATIC ACTION IN THE CENTER OF THE WAFER 7 MILLIMETERS BELOW THE CENTER OF THE DISTANCE LENS: — 7 — 2 CYL. 180?

The key to its solution is to be found in the law that "a lens decentered one centimeter will produce as many prism-diopters as the lens has diopters of refraction."¹

The center of the wafer being 7 millimeters (0.7 cm.) below the center of the distance lens, makes it obvious that we have a prismatic action at this point, operating vertically, and due to the decentration of both the spherical — 7 and the cylinder — 2 ax. 180, which is equivalent to a decentration of 0.7 cm. on 9 D. to be neutralized by the wafer. Reverting to our law: 9 D. decentered 1 cm. affords 9 Δ (prism-diopters) Δ , therefore, 0.7 cm. will give 0.7 of 9 or 6.3 Δ as the prismatic action to be overcome.

The wafer + 2.5 decentered 1 cm. gives only 2.5 Δ , so that it takes a decentration of 2.5 cm. to produce $2.5 \times 2.5\Delta = 6.25\Delta$.



(Fig. 5.)

(Fig. 6.)

which it will neutralize, with the error of 0.05 Δ , when placed with its thin edge at the lower edge of the concave distance lens. The lens + 2.5 to be large enough for so great a decentration must be, as will be later shown, at least 64 millimeters in diameter, and should be ground to a knife-edge to insure maximum thinness. As this case is one that came under my own observation, the instructions given to the mechanic who successfully executed the lenses, are here repeated as follows:

"Make a 2.5 D. periscopic convex lens (+ 7 — 4.5) 64 millimeters in diameter, worked to a knife-edge at the periphery, and, after marking its optical center, lay off four points, P. P. P. P., 25 millimeters from the center, as shown in diagram Fig. 5:

¹A Metric System of Numbering and Measuring Prisms, by Chas. F. Prentice, pages 180 and 181, *Archives of Ophthalmology*, Volume 19, No. 2, New York, 1890.

“Replace the lens on the *convex* grinding tool, and cut the lens through the indicated dotted right-angled diameters into four equal parts. This will secure four wafers and will provide against accident. Select for both eyes two of the most perfect quadrants, and cut from them the peripheral segments to the shape indicated, and cement them into the concave 7 D. spheres, with their thin edges down, when a line LL viewed through the reading lenses will appear continuous as in Fig. 6.”

It is obvious that the diameter of the lens is determined by adding twice the decentration (25×2) to one full width of the wafer (7×2) which gives 64 millimeters.

It would be very difficult to solve this simple problem so lucidly by any other means than the prism-diopter.

RETINITIS PIGMENTOSA. REPORT OF CASE.

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BY the term retinitis pigmentosa is meant a degeneration of the retinal tissue with a deposit of pigment in its deeper layers, accompanied as it always is by certain characteristic subjective symptoms. The term "retinitis pigmentosa" is certainly histologically misleading, for one would naturally expect in that event to find an inflammatory condition of the retina with the attendant increase of elements which usually takes place under this pathologic condition, while, in fact, the morbid process is atrophic rather than hyperplastic. Prof. Fuchs in his late text-book on ophthalmology uses the term "pigmentary degeneration of the retina," which is certainly more suitable, since it affords a clearer idea in regard to its minute histology. Mr. Frost, of London, in a lecture upon this subject, and which was also published in the *British Medical Journal* of Dec. 1889, takes exception to the term "retinitis pigmentosa" as being misleading, because, first, the disease is much more of a degenerative than an inflammatory type; secondly, pigmentation of the retina occurs in other conditions; and thirdly, in many cases which must certainly be included under the title, retinal pigment is present in quite an insignificant quantity. Having thus pointed out as to what is meant by the terms which head this article, I shall proceed to narrate the history of a case which came under my care some time ago, and which presents the question of hereditary transmission in this disease:

Mr. P. L., 29 years of age, editor of a paper in the southern part of the state, was referred to me by his family physician to see if there could not be an improvement made in Mr. L's vision.

The family history showed that both father and mother were living, the former being in his seventieth and the latter in her fifty-sixth year. Both are strong and healthy. The patient has five brothers and two sisters living and one brother dead. His father has never suffered with any disease of the eyes and of late can read without glasses, which is probably due to incipient cataract. He also commenced wearing glasses when he was sixteen years old, although they did not materially aid his vision, complaining at the same time that his sight became much worse towards evening. He also complains of severe headache.

Patient's grandmother (father's mother) became totally blind at the age of sixty, having suffered in her early years just as the patient's father. His grandfather had no impairment of vision. The brother who died was affected with his eyes in the same manner as our patient, while the younger sister, 12 years of age, is similarly afflicted. The remaining members of the family have good vision.

Past history: Patient has never had severe illness within his recollection nor has he ever suffered with any venereal trouble. On this latter point the history is very clear. His mother discovered when he was a year old that he could not see well, especially towards evening. He himself has noticed this dimness of vision for a long time and seemingly it becomes neither better nor worse. Towards evening he is almost perfectly blind, and hence dark days are troublesome to him. He can see perfectly well when looking directly in front, but if he is crossing the street he cannot observe vehicles which come upon him from the sides. Has tried numerous glasses without the slightest improvement.

Examination of the eyes: O. D., V. = $\frac{20}{30}$, not improved by glass. O. S., V. = $\frac{20}{30}$, not improved by glass. Javal is negative as far as astigmatism is concerned. Pupils react to both light and accommodation. The perimeter shows marked contraction of the field of vision, extending out not more than 10° in any direction. This latter was for white, while for colors it was still more marked.

Ophthalmoscope reveals a hazy optic disc. The macula cannot be seen probably due to the degenerative changes. Scattered in the retina, especially towards the periphery, are "web-like" splashes of pigment resembling bone corpuscles in shape, which is a form so characteristic of this disease.

With these objective and subjective symptoms before me it was not difficult to make the diagnosis of retinitis pigmentosa, which is claimed by some authors to be one of the easiest recognized of all ocular diseases so characteristic are its symptoms. Of these latter three are considered pathognomonic, although they may not all be discoverable in the same case. These are:

1. Hemeralopia¹ or night blindness, *i. e.*, a reduction in the acuity of vision when there is a reduction in the surrounding light.
2. Contraction of the field of vision for all colors.
3. The presence in the retina of pigmented spots in the shape of "bone corpuscles."

Hemeralopia and contraction of the field of vision are symptoms which are universally present while pigmentation of the retina recognizable by means of the ophthalmoscope is by no means so universal. The symptom hemeralopia cannot of itself be pathognomonic of this disease, although the most characteristic for there are other affections of the eyes in which it is present, but

¹The word "hemeralopia" continues to be used, for the want of a better term, though it is indefinite, pathologically.

it is also true that this symptom is more universally coincident with some disease of the retina than in any other ocular affection.

Chas. Zimmerman, in an excellent article in the *Archives of Ophthalmology*, Vol. I. on "A Review of the Theories of Hemeralopia," discusses at length the different diseases of which this condition is a symptom, but arrives at the same conclusion which other authors before him have done, and that is that this symptom is much more frequent in diseases of the retina than in any other ocular affection. Von Graefe has said that hemeralopia constitutes the most characteristic symptom of all others in diseases of the retina. Uhthoff in the *Berliner Klin. Wochenschrift*, 1890, gives a very interesting contribution to the subject of this symptom and attributes many cases as due to strong sunlight and imperfect nourishment. Among 15,000 demented men, one-third of whom were "topers," there were twenty-seven cases of hemeralopia. According to Prof. Leber, of Heidelberg, now recognized as being the best authority on ocular pathology, this symptom is caused by a congenital atrophy of the retina to which in the later stages is added pigmentation. The same writer also remarks that the pigmentation cannot always be seen with the ophthalmoscope which is another argument against the use of the term retinitis pigmentosa. That such undoubtedly occurs is seen from a case reported by Porut, quoted by Zimmerman in the volume of the *Archives* referred to. A man, 21 years old, suffering from congenital hemeralopia died of scarlet fever. An anatomical examination of the eye was made, and there was found a deposit of pigment in the deeper layers of the retina, especially in the external granular layer.

Some writers, especially Mormoyer, think that the stimulating light of the sun produces a deposit of pigment similar to those on the skin. Prof. Schweigger, of Berlin, a most careful observer and writer, has noticed the presence of hemeralopia and contraction of the field of vision in children before the appearance of any pigment in the retina. He also observed in older persons hemeralopia and contraction of the visual field without any trace of pigmentation of the retina or any other symptom except contraction of the arteries and paleness of the disc. He, therefore, thinks that the torpor of the retina is, in all probability, not due to pigmentation of the retina, but to the obliteration of the vessels or of their caliber through hypertrophy of their coats so that the retina obtains a diminished and insufficient supply of blood. These ideas of Schweigger agree in a great measure with the facts since ascertained by microscopical study.

Wangenmann has furnished an excellent article in Graefe's *Archives*, April, 1891, dealing with the micro-anatomical study of an eye which had suffered from retinitis pigmentosa. He arrives at the same conclusion as before theoretically announced by Prof. Leber, and that is that the condition in the retina arises from disorders of the choroidal circulation—a theory also supported by the facts of experimentation since it has been found that if obliteration of the choroidal circulation be produced, the condition of retinitis pigmentosa will also follow. Thus all investigations have shown that this pathologic condition is dependent more or less upon a mal-nutrition of the retina while clinical cases have clearly demonstrated that heredity plays a most prominent role. Many writers have reported cases bearing upon this latter point and it is only for this reason that I have detailed the case above. So conclusive has been the evidence as showing the importance of heredity and consanguinity in this disease that it is now almost universally accepted.

Mr. Morton, of London, has reported an interesting case showing not only the stamp of heredity, but also the fact that objective changes in the retina are not always discernible. The case was one of an uncle and nephew where there were all the subjective symptoms of retinitis pigmentosa, night blindness, contraction of the visual field, but no objective changes could be seen with the ophthalmoscope. Fifteen members of the family were affected in the same way, and strange to say, they were all males.

Mr. J. Hutchison in vol. I of the *Ophthalmic Review*, has given us an excellent article on this ocular disease and its allied affections as illustrating the laws of heredity. He reports in all twenty-three cases, eight of which sprang from marriages among relatives, among whom there was no record of a previous case of the kind. The author thinks that consanguinity is undoubtedly as important a factor in the development of retinitis pigmentosa as it is for deaf mutism and idiocy.

Macheck quoted in the *Archives of Ophthalmology*, June, 1882, gives cases of seven children of consanguineous parents, five of whom were affected with retinitis pigmentosa, hemeralopia and atrophy of the disc. The symptoms first manifested themselves after the tenth year. The eyes were mostly myopic, three had color blindness, one being complete, and the other two partial.

Priestly Smith, in the *Ophthalmic Review*, vol. I, December, has reported an interesting case of retinitis pigmentosa connected with the history of maternal shock. In the case as recorded there was no constitutional nerve disorder in the earlier generations and no consanguineous marriages. All the children were healthy.

The patient had suffered a severe nervous shock during early months of pregnancy and the child thus delivered and all subsequent children developed retinitis pigmentosa with partial deaf mutism. The last case is interesting and bears out the statement made by Prof. Fuchs that "it (retinitis pigmentosa) is often found at the same time with other congenital anomalies like deafness, mental weakness, harelip, etc."

An unusually interesting case is mentioned by Norris and Oliver in their late text-book on ophthalmology. Currier, in a memoir published by the *Soc. de Medicine de Grand*, 1838, has related the history of a family in the commune of Vendemian, near Montpellier, in which the hereditary transmission could be traced for two centuries or six generations. So universally is there a history of heredity or consanguinity in all cases of this disease that when such is not the case they are reported for their variety. For instance, Ayres, of Cincinnati, has reported such a case simply on the grounds of the absence of a history of consanguinity.

The lamentable fact remains that like some other diseases that are easily diagnosed retinitis pigmentosa is unfortunately, but little, if any, benefitted by treatment.

At the last meeting of the International Ophthalmological Congress at Edinburgh in August of this year, Valude reported certain forms of optic nerve atrophy which he had successfully treated with antipyrin. The report did not say whether he used this remedy subcutaneously or not. Since in a large number of cases, atrophy of the optic nerve is present with this condition of retinitis pigmentosa, we do not see why the same remedies would not be beneficial in both cases, especially as the changes are of the degenerative type in both.

Haskett Derby, of Boston, has reported several cases where the patients have received decided benefits especially by the increase of the visual field through the application of a weak galvanic current about the eyes.

To sum up our ideas as expressed in this article:

1. Retinitis pigmentosa is an atrophy of the retina followed in the later stages by a deposit of pigment beginning usually in its deeper layers.
2. Its most prominent symptoms are: (a) Hemeralopia or night blindness. (b) Contraction of the field of vision for all colors. (c) The appearance in the fundus oculi of pigmented spots in the shape of "bone corpuscle" especially towards the periphery.
3. It is a disease in the majority of cases hereditary, and more especially if there is a taint of consanguinity in the family.
4. The treatment seems to be powerless, but those remedies should be used which are nervines and alterative tonics.

The Grand.

RIPENING OF IMMATURE CATARACT BY DIRECT TRITURATION.

BY BOERNE BETTMAN, M. D.,
OF CHICAGO.

BY way of introduction of my report of a successful case of ripening an unripe cataract by direct trituration, permit me to review in a concise manner the history of this innovation and the reasons which led to its adoption.

Up to ten years ago oculists regarded the complete maturity of a cataract as a *sine qua non* prior to the undertaking of an operation. Old men and women were forced to wait tedious months and years for the fruition of their hopes, and only then when qualitative vision was entirely abolished, when sight was reduced to mere perception of light would the operator venture to extract the lens. The pleadings of patients for more rapid relief, and the inherent instinct of progressive men for medical advancement prompted many oculists to devise methods by which maturity of the cataract could be hastened. The one most frequently employed is that of Förster, of Breslau. The principle involved is to break down the lens fibers and thus induce their rapid degeneration and opacity. This is accomplished by pressing on the cornea, after doing an iridectomy, with a spoon or strabismus hook. The force is transmitted indirectly to the unripe cataract, and through this massage it is rendered entirely opaque in a varying period of time.

Many observers complained of the iritis set up by the mechanical irritation to which the rainbow membrane is subjected by this procedure. Mr. McHardy in a paper read at the Eighth International Congress of Ophthalmologists, held at Edinburgh, in August, 1894, mentions its occurrence in this connection in from 2 to 17 per cent of all his cases. Another objection which held good in 1883 was the necessity of doing an iridectomy. This, however, has been obviated since White, some two or three years ago, introduced his modification of first making a paracentesis, and drawing off the aqueous humor, thereby permitting the lens to come in contact with the posterior surface of the cornea, and then making massage. To obviate these difficulties and to insure more rapid ripening, I in 1883, for the first time, essayed my method of direct trituration. The result obtained was so satisfactory that I

have depended upon it ever since. Up to the time of the introduction of the simple extraction, I combined the massage with an iridectomy. In the last few years, however, I have not excised a piece of the iris, but have practiced the simple direct massage only. After entering the anterior chamber with a small lance-shaped knife, as is done in a glaucoma operation, a trowel-shaped spatula is introduced, its flat surface placed against that of the lens, either in the pupillary area or when the iris is contracted underneath the iris and a half dozen to a dozen passes made over the cataractous lens. The pressure exerted is uniform and naturally not very severe. This done, the spatula is removed, the eye washed with an antiseptic solution and bandaged never longer than two days. Ordinarily one day will suffice.

In 1887 I first made known my operation in a paper read before the Chicago Medical Society, and later published in the first December number of that year of the *Journal of the American Medical Association*. In the discussion which followed fear was expressed that direct massage might cause dislocation of the lens and subsequent complications, as cyclitis and destruction of the eye. These *a priori* objections were replied to and satisfactorily explained. In a subsequent article published in 1892 in the *Chicago Medical Recorder* of April, a report of seventeen successful consecutive cases, with excellent results in each, must be regarded as conclusive evidence of the innocuousness of direct trituration. In only two of the cases reported was there a slight escape of vitreous during the extraction of the cataract due to accidents at the time of the operation. This slight mishap, however, did not affect in the slightest degree the final results.

During the last few years authorities like Knapp and Hirschberg have decried all methods of artificial ripening. They claim they are unnecessary, since cataracts can be successfully extracted even if not perfectly mature. The danger of transparent lens substance which may adhere to the posterior surface of the anterior capsule or in the bag proper, is not feared by Knapp, owing to its imprisoned condition in the capsular sac which follows a peripheric capsulotomy. Others again, especially Wickeriawicz, thought the transparent lens substance which did not escape with the main body of the cataract could be flushed out of the anterior chamber with an antiseptic solution. At the Milwaukee meeting of the American Medical Association in 1893, I devoted special attention to these points in a third paper on the subject of "direct trituration." I again advocated the harmlessness of my method by

describing experiments made on rabbits for the express purpose of determining the amount of pressure which could be exerted upon the lens without disturbing its anatomical relationship; in other words, to ascertain how forcibly the lens could be triturated without rupturing capsule and suspensory ligament. In every case I succeeded in producing more or less opacity of the lens; in none was injury done to the capsule or zonula zinn, although the trituration was far more severe than I would dare to attempt in a human eye. I also reported two cases in which the cataract was so slightly advanced that a dim view of the fundus was discernible. I wish to re-emphasize in this paper, as I have done in the others, that I exclude from these remarks sclerosed amber-colored cataracts such as never become altogether opaque. These two cases which were successfully ripened, and extracted within three weeks were intended to refute the claims made by the adherents of extraction of not fully mature cataracts, for I doubt whether any conscientious oculist would have ventured to operate on the cases to which I have just referred, in the slightly advanced condition or stage of opacity of the lens in which I found them. To the query, at what stage of immaturity of the cataract the advocates of extraction of unripe lenses operate? How slightly advanced may the cataract be when these gentlemen will attempt its removal?

No answer was given in the discussion which followed the reading of my paper. The time is long since past when complete maturity of a cataract is deemed essential before an operation is considered justifiable. Very few men will hesitate to remove an opaque lens with the superficial part of the anterior cortex still transparent. Extraction of cataracts (softer variety) from eyes having $2\frac{3}{20}$ vision is now practiced daily. But do the defenders of early extraction operate where fingers can be counted at a distance of from 8 to 10 feet? Do they attempt to remove cataracts (softer variety) through which parts of the fundus can still be seen? Until I am answered in the affirmative, I shall continue to doubt the advisability of extracting such, relatively speaking, highly immature cataracts.

The statements made with regard to the removal of unripe cataracts must be accepted with limitations which have not as yet been accurately defined. As an illustration of the above, I will detail the clinical history of Mr. H. C., who was operated on a few months ago. He was admitted into the Illinois Charitable Eye and Ear Infirmary June 26, 1894, with the following diagnosis: R. E. immature senile cataract. Anterior cortex, with the excep-

tion of a few broad striæ at the outer edge, perfectly transparent. Body of lens showed broad satiny opaque bands. A dim red reflex obtained on ophthalmoscopic examination through parts of the lens. When patient is placed with back at the intersection of two windows at one end of a room, fingers are readily counted at a distance of 8 feet near the other end of a dimly lighted chamber. Obscuration of sight was noticed about three years ago. Left eye incipient cataract. On July 5, after having thoroughly cleansed the face, eyebrows, with soap, and, later on, the lids and conjunctival sac with a 1:5000 solution of bichlorid of mercury. I passed a small lance-shaped knife into the anterior chamber, entering about 1 mm. behind the upper corneo-scleral margin. The incision was made large enough not to interfere with the lateral movements of the trowel-shaped spatula. The latter instrument was quickly passed through the opening to prevent the escape of aqueous humor. The depressed flat end was slid over the lens in the large pupillary area. Firm but even to and fro passes were made, care being taken not to rub the iris with the shank of the instrument. After its careful and rapid removal, the eye was again flushed with the bichlorid solution, a drop of atropin was instilled and both eyes bandaged. The next day the eye appeared absolutely normal excepting a slight rosiness in the region of the incision. On the second day the bandage was entirely removed and the patient given the liberty of the institution. Two weeks later vision had decreased to perception of light only. On July 26 I prepared the patient for the subsequent extraction of the now fully ripe cataract by again subjecting him to the antiseptic rigor carried out in all operative patients. With a Graefe's knife I made a corneal flap upward through two-fifths of the corneal area. The rapid escape of the aqueous humor floated the iris upon my knife, necessitating an iridectomy which was followed by a T-shaped capsulotomy. The body of the lens was easily delivered. The sticky adhesive opaque cortex was readily forced out in bulk by pressure on the cornea by a spoon. Instillation of an antiseptic wash and atropin was followed by bandaging of both eyes.

July 29, bandage removed and eye found in a passive condition. From this time on the patient made an uneventful recovery. During the entire period no injection of the eye was present and patient did not complain of any discomfort. On August 16 he was discharged, 12 D. glass giving him $V. = \frac{1}{8}$. He is expected to return for a change of glasses; the addition of a cylinder will

no doubt increase his visual power. Knowing that the cortex was opaque throughout and feeling certain that it could readily be removed, and thus avoid secondary iritis and cyclitis, I made a T-shaped opening in the capsule and have saved the patient the annoyance of a secondary operation. It may be argued that the discomfiture to the patient, arising from a secondary capsulotomy, is no greater than that due to trituration of the lens. This I readily admit. In both cases he is subjected to two operations. But other things being equal, by direct trituration he derives the greater advantage of having his cataract fully ripened and escaping the dangers due to floating pieces of transparent cortex in the anterior chamber. This danger is lessened by doing Knapp's periphtric capsulotomy. Furthermore, of more importance is the fact that direct trituration hastens the ripening of a cataract. It is applicable to such cases where an early extraction would probably not be undertaken. It saves the patient valuable time and relieves him much sooner of the miseries his complaint subjects him to. In conclusion, I will again repeat the conclusions deduced from my years of experience and the twenty-four consecutive reported cases.

(1) Artificial ripening of cataracts is in properly selected cases demanded; (2) direct trituration is preferable to other methods; it is easily performed by one possessing ordinary skill; (3) it is not followed by any untoward symptoms, consequently it is a safe and reliable procedure; (4) it is not indicated where sclerosis involves the bulk of the lens; (5) it is especially useful in senile cataracts with soft cortex; (6) the results of the massage are marked and rapid; (7) maturity of the cataract is usually induced in three weeks, often sooner; (8) very little discomfort is caused the patient aside from bandaging the eye two days; (9) at the subsequent extraction of the lens, the cortical substance is readily removed and dangers of iritis and suppuration of the corneal wounds are lessened.

FIBROMA OF EYELIDS.

BY GEO. H. GOODE, M. D.,
OF CINCINNATI, OHIO.

OPHTHALMIC SURGEON TO CHRIST'S HOSPITAL, AND ONE OF THE OPHTHALMIC SURGEONS TO OPHTHALMIC AND PRESBYTERIAN HOSPITALS.

PATIENT 35 years of age. Twenty-five years ago the growth appeared and slowly attained the proportions which it had when I first saw him. The length and width of the upper lid were double that of the normal; the thickness was about four times the ordinary. The lower lid was also affected, but to a less extent, and was entirely hidden from view by the upper lid, which hung over it and extended below the margin of the orbit. Figs. 1 and 2. The growth was not pedunculated, but there was a clear line of



Fig. 1.



Fig. 2.

demarcation between the hypertrophied and fairly normal tissue. So that I found that it would be possible to remove all of this structure without shortening to any degree the palpebral fissure. In order to procure anything like a normal lid, I found that it was necessary to remove a complete section of the outer third or more of the man's lids—as he presented himself. The portions removed were triangular in shape—the margin of the lid forming the base of the triangle, and the apex at the margin of the orbit. The flaps were drawn together and united by deep silk sutures. The dressing, which consisted of iodoform gauze, was not disturbed until the third day, when it was found that the wounds were firmly closed,

the parts coapted and the lids with their proper relation to each other. The ptosis which still exists is due to the still abnormal weight of the upper lid and also, doubtless, to the absence of the levator muscle, which has undergone changes from disuse. The eye itself has not suffered in the least, and it is possible that a **ptosis operation** may be of service to him.

It may be of interest to know that the man is the subject of multiple fibromata, **having** the characteristic growths (varying in size from a hazelnut to a walnut) scattered over his entire body.

EMBOLISM OF THE INFERIOR BRANCH OF THE CENTRAL RETINAL ARTERY.

By GEO. H. GOODE, M. D.,
OF CINCINNATI, OHIO.

Mr. ———, 36 years of age, druggist, called to see me in April, 1894. He stated that several days before, while filling a prescription, he noticed that the upper half of the field of the left eye was suddenly obliterated. Upon examination with the ophthalmoscope my attention was immediately attracted by an opaque something, in relation to the lower branch of the central artery, situated a short distance from the papilla. Close examination with the direct method showed that there was a bulbous distention of the vessel. This, together with the bloodless appearance of the vessel beyond this point, made it evident that the condition had been produced by an embolus. The veins were not altered in size, the retina was edematous (almost the entire lower half appeared of a milk white color); there were no hemorrhages. Upon examination of his heart, I found that he had a mitral regurgitant murmur. He gave a history of inflammatory rheumatism ten years previous. I saw him but a few days ago and found his condition, as far as the vision was concerned, unchanged.

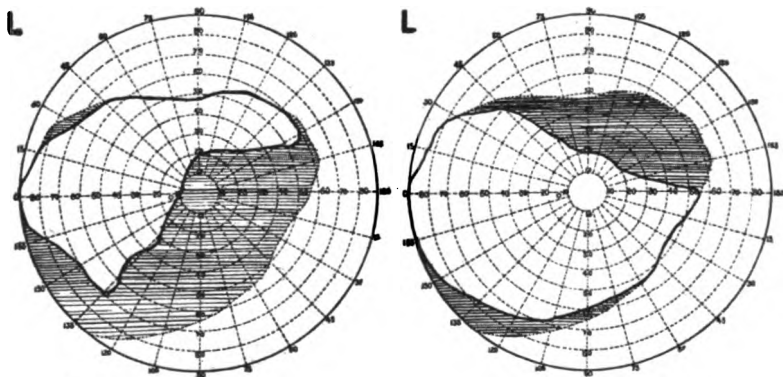
DETACHMENT OF THE RETINA.

BY WM. E. BRUNER, A. M., M. D.,
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THE following case of detachment of the retina was of considerable interest to the writer, and, although not very rare, may be worthy of mention as showing the change in the location of a recent detachment from the upper to the lower portion of the fundus.

R. M., 50 years of age, had never had any trouble with his eyes until one week or ten days ago when he noticed while at work that he could not see anything with O. S. His general condition



(Fig. 1.)

(Fig. 2.)

is fairly good, but he occasionally has some chronic rheumatism. Denies venereal history. Is a rather heavy smoker. Urine analysis is negative.

Ophthalmoscope revealed in O. D. some fine floating vitreous opacities, slight general disturbance of choroid and partial crescent of choroidal disturbance at outer edge of disc. V., O. D. = $\frac{5}{15}$. With correction sph. + 1 \odot + cyl. .25 ax. 180°, V. = $\frac{6}{6}$.

In O. S. the ophthalmoscope showed fine floating opacities in the vitreous, and a large detachment of the retina up and out, and another smaller one up and in. These two met in the far periphery, leaving a narrow triangular portion of the retina still

adherent between them above the disc. The whole macular region was included in the detached portion. The refractive condition varied from the ordinary in such cases in that it was here hypermetropic. Tension in the eye was normal or very slightly diminished. V. = counting fingers excentrically. The detachment could be seen to move with the movements of the eye, showing an accumulation of liquid beneath the retina. Careful perimetric measurement of the field gave the following result: (Fig. 1.)

Unfortunately it was impossible to give the patient any treatment which involved rest in bed, and we were obliged to do the best we could under the circumstances. Nine days later when he reported to the clinic, he had some central vision = $\frac{1}{40}$. The ophthalmoscope now showed reattachment of the retina over almost the entire area previously involved, and the retina normal in color with nothing but some choroiditis and some apparent wrinkles in the retina to show where the detachment had been. Directly below the disc, however, there was now a detachment much smaller than the former one, but extending far out into the vitreous.

The field as taken with the perimeter is shown in Fig. 2.

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ABSTRACTS FROM CURRENT AMERICAN AND ENGLISH OPHTHALMOLOGICAL LITERATURE.

By CHARLES H. MAY, M. D.,
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CORNEAL SUTURE IN CATARACT EXTRACTION.

Dr. E. Kalt, Paris, (*Archiv. of Ophthalmology*, Vol. XXIII, No. 4). In order to diminish the danger of occurrence of prolapse of iris, Kalt uses a corneal suture in cataract extractions. He has practiced the procedure in fifty cases of simple extraction and was well satisfied with the results. He reports only two point-like hernias in these fifty cases—4 per cent. and says that without the suture he has never seen less than 8 per cent of prolapse among the 180 extractions which he performs each year. He says in this connection: "The corneal suture gives, I believe, a satisfactory solution of this prolapse question which has become a real nightmare. It is to be hoped that neither the spirit of routine nor the fear of making the operation two or three minutes longer will prevent the new procedure from spreading." He mentions Williams, of Boston, as having published encouraging results from suturing the cornea after cataract extraction in 1867, and also describes the method used by Suarez de Mendoza to accomplish the same purpose.

He describes his method of procedure in the following words:

"I use very fine, short, sharp-pointed needles and thin but strong silk thread. The needles, when armed, are sterilized in hot air and kept for use in a sterilized paper envelope. After cocainization and disinfection, I pass the needle through the cornea in the vertical meridian, about 1 mm. underneath the limbus; the point, without penetrating into the anterior chamber, emerges at the juncture of the opaque border, and the thread is drawn. Then the needle is introduced, about 1 mm. above its point of exit, into the episcleral tissue, as is done in the muscular advancement. As soon as I find that the point has penetrated into resistant tissue I draw it out again, in order to involve as little of this tissue as possible. As it is impossible to draw the needle out at right angles, about 2 mm. of conjunctiva are loaded on it, which is of no consequence. In drawing this thread I leave a loop, which is

placed sideways toward the nose, and spread out carefully so as to avoid twisting. The corneal section is made in the ordinary way, care being taken that the knife passes nicely through that portion of the cornea which the suture has left free. Then I take off the speculum and remove the cataract as usual. When the iris is well in position, an assistant hold the upper lid up, and I tie the thread.

.. It is to be borne in mind that I do not, like Suarez, make a superficial incision into the limbus corneæ, in the depth of which lie the points of entrance and exit of the thread, for this makes the corneal section with the narrow knife very difficult without cutting the thread in so narrow a passage. The coaptation in my procedure seems to me quite sufficient. Furthermore, I am not afraid to draw the knot tightly at the risk of folding the cornea. This folding disappears in a day, and the corneal astigmatism is neither increased nor diminished.

.. The suture does not inconvenience the patient. Rarely I remove it before the tenth day, when it has become quite loose. With one stroke of the scissors I cut off the knot, and seize the thread with forceps.

.. Accidents to guard against: Involuntary cutting of the thread with the Graefe knife. This is rare. Generally a new needle can be passed through the hole of the old. When the suture is tied, we should draw on the superior, scleral end of the thread. The coaptation takes place by itself. The opposite would be dangerous. I can affirm that the suture infects the cornea in no way. The slight opalescence left in its track disappears quickly."

NOTE ON NINE HUNDRED AND TWENTY-FIVE EXTRACTIONS OF CATARACT.

Charles Higgins, F. R. C. S., Eng. (*The Lancet*, August 11, 1894.) The writer gives the results of 925 cases of extraction of cataract. Concerning his method of operating, he says: "My method of operating is now (and has been for many years past) to hold the upper lid away with the end of the ring finger, fix the eyeball below the horizontal meridian of the cornea, and make the forceps keep the lower lid out of the way (I rarely use a speculum). I make my incision with a Graefe's knife, by puncture and counter-puncture in the sclero-corneal margin, cut in the sclero-corneal margin to near its upper part, but finish the section rather within the corneal border. If I am going to do iridectomy, before commencing the incision I pass a suture through the

conjunctiva below the margin of the cornea and leave it hanging on the patient's cheek; then, if I want the eye drawn downwards, I tell the patient to look down, draw the suture moderately tight, and get an assistant to put his finger on it, and so the eye is kept fixed in the desired position without being touched with the forceps, and the silk thread acts as a speculum to the lower lid. I keep the upper lid out of the way with the finger of the hand which holds the iris forceps. I remove the cataract by pressure through the lower lid with my fingers, or directly upon the eyeball with the curette."

OBSERVATIONS ON SOME PHASES OF OPACITY, AND ON LUXATION OF THE CRYSTALLINE LENS.

L. L. Thompson, M. D., Indianapolis. (*The Ophthalmic Review*, October, 1894.) The author concludes his paper with the following resumé:

1. Segmental opacities of the lower inner portions of the lens usually remain stationary for many years, rarely do they cause blindness.

2. Annular opacity, or "Arcus senilis lentis," is often met with in persons under 30 years of age. Women seem to be more subject to it than men; it rarely passes beyond the periphery until after middle life, when it sometimes extends in the form of a minute speckled opacity of the whole anterior surface of the lens, again becomes stationary, and seldom causes blindness.

3. Cataract is occasionally cured spontaneously by liquid degeneration within the capsule.

4. Congenital ectopia lentis is by no means a harmless anomaly. Its subjects are usually highly myopic, and have greatly reduced acuity of vision. It may cause loss of vision by glaucoma, and ultimately destroy the sight by luxation of the lens downward, thereby starting inflammatory action.

5. Spontaneous luxation downward of a cataractous lens of an elderly person often takes place. It gives temporary sight to the patient, but the end is usually suffering and loss of vision.

6. "Second sight" is a danger signal. It is always caused by increase in the conjugate axis of the lens incident to incipient cataract. It is frequently present long before the faintest sign or symptom of cataract. It is often brought on by long-continued congestion of the fundus (as seen by numerous floating particles in the vitreous humor), by a relaxed suspensory ligament, and by luxation of the lens forward.

TROPA-COCAIN AS A LOCAL ANESTHETIC IN EYE SURGERY.

T. J. Bokenham, London, (*Trans. Ophthalmological Society, United Kingdom*, 1894). The writer's observations confirm the favorable reports already received concerning this new coca base. Schweigger and Silex had found that anesthesia from tropa-cocain came on more rapidly and lasted longer than that produced by a similar strength of cocain and that when prepared with a $\frac{3}{4}$ per cent solution of salt was practically free from irritation. Chadbourne found that it was four times less poisonous than cocain. Bokenham found that the new drug possessed but feeble toxicity as compared with cocain, and but little effect either upon the heart or blood-pressure. In a 3 per cent solution made up with saline solution it was practically non-irritating to the eye. Complete anesthesia was produced in two minutes with one or two drops of a 3 per cent solution: it caused no dilatation of the pupils, no paralysis of accommodation, no drying of the corneal epithelium, no dilatation of the conjunctival vessels. The 3 per cent solution was not quite strong enough for the use of the mitigated stick, and for this purpose, he used a 10 per cent solution.

His conclusions are: "(1) Tropa-cocain does not cause dilatation of the pupil, or any disturbance of accommodation. (2) It is less poisonous than cocain, the toxic dose being at least four times as great. (3) It does not affect the vascular condition of the eye like cocain and the other local anesthetics. (4) It does not produce unpleasant effects if swallowed during an operation, nor does it produce discomfort in the throat like cocain. (5) In form of a solution it keeps far better than a corresponding solution of cocain, and in discs it would keep indefinitely."

A NEW OPERATION FOR TRICHIASIS AND DISTICHIASIS.

W. Spencer Watson, London, (*Transactions of the Ophthalmological Society of the United Kingdom*, 1894). This new "button-hole and button" operation is recommended for those cases of trichiasis and distichiasis in which the central part of the eyelid is chiefly or solely at fault. The first step is to make the "button-hole." "An incision is made through the posterior edge of the tarsal margin to the extent of 3 to 4 mm. and laterally to a little beyond the faulty lashes. This is completed by a transverse incision through the skin parallel to the tarsal margin deep enough to meet the upward incision and thus form a bridge of tissue including the roots of the lashes. (2) A "button" of oval form with its long axis parallel to the tarsal margin is now marked out

in the skin immediately above the "button-hole;" the skin and adjacent fibers of the orbicularis muscle, are incised in a curvilinear direction so that the lower border of the oval "button" corresponds with the line of the skin incised in making the "button-hole;" the deep surface of the "button" remains attached to the cartilage. (3) The "button" is passed downward through the "button-hole," and retained there by a few sutures and a dry dressing of cotton wool and styptic colloid. * * * The width vertically of the "button" may be varied according to the amount of inversion of the faulty eyelashes. Generally, it should be about 3 mm. in vertical width." The transposed "button" assumes a semi-mucous character and shrinks in dimensions.

A CASE OF CEREBRAL CLOT; LOSS OF VISION FOLLOWING INJURY; TREPHINING; RECOVERY.

John B. Hamilton, M. D., LL. D., Chicago, (*Journal of the Amer. Med. Asso.*, Dec. 22, 1894). Dr. Hamilton's case is interesting on account of the restoration of the sight of one eye after removal of a clot from the optic commisure. The patient had been injured six months previously by being struck on the top of the head just posterior to the fissure of Rolando of the right side. There was headache; right eye became gradually and totally blind; deafness of right ear beginning almost immediately after the injury; no motor paralysis, nor loss of taste or smell. Vision and hearing normal on left side. Ophthalmoscopic examination negative except "O. D. slightly vascular." The patient was trephined; temporary resection of cranial wall; the dura mater incised; silver wire loop passed downward and forward toward the optic commisure withdrew a firm round coagulum about 3 cm. in length; dura sutured; bone replaced and wound closed; patient recovered. Seven months later the patient was again examined. The vision had been restored from the date of operation. One year after the operation the patient had normal hearing and vision.

CELLULITIS FOLLOWING MULES' OPERATION.

Sydney Stephenson, F. R. C. S., (*Ophthalmic Review*, Sept., 1894, and *The Lancet*, Sept. 22, 1894). After pointing out that Mules' operation has been before the profession for nearly ten years and that great differences of opinion still exist as to its value, Stephenson narrates a case of cellulitis occurring in one out of a series of thirty cases in which the operation was performed, no

untoward results having followed in any of the other twenty-nine cases. The operated eye had been injured six years previously and was tender and irritable at the time of the enucleation. After three months the orbital stump was removed by dissection; an irritable remnant remained which did not tolerate the insertion of an artificial eye. The writer explains the accident as caused by septic infection either during the operation or else, and more probably, that organisms had been introduced six years before and that these had been roused into activity by the surgical interference.

THE USE OF CHLORIN WATER IN OCULAR THERAPEUTICS.

J. W. Lawford, London, (*Transactions of the Ophthalmological Society of the United Kingdom*, XIV, 1894). After pointing out that the employment of liquor or aqua chlori in ocular therapy is by no means new, the writer states that it seems to have fallen into disuse of late years and is not mentioned as a remedy in many of the modern text-books. His experience with the remedy has been very satisfactory when used as an antagonist to suppuration which had already begun. He appends the histories of a number of cases. In two cases of severe hypopyon the chlorin water was used as an injection into the anterior chamber with excellent results. To be suitable for use it must be freshly-prepared; it is very apt to decompose, the chlorin changing to hydrochloric acid and the preparation then being unfit for application to the ocular tissues. "I do not pretend that this remedy is wholly satisfactory," * * * "but I consider it one of the most applicable of the known germicidal remedies, and it has certain distinct advantages over some of its competitors. It has been shown experimentally that its effects upon the intra-ocular tissues is much less harmful than that of other strong antiseptics, and as an application to the surface of the eye it is less painful than any of the more commonly used solutions, *e. g.*, nitrate of silver, perchlorid of mercury, etc."

THE THERAPEUTIC VALUE OF ICE IN OPHTHALMIC SURGERY

Angus McGillivay, M. B., Dundee, (*The Ophthalmic Review*, September, 1894). The writer calls attention to the comparative want of attention given to cold as a therapeutic agent in modern ophthalmological text-books. "After an extensive use of cold in the treatment of ocular injuries, I have no hesitation in stating that of all remedies at our disposal, it is undoubtedly the best." He believes it is fast losing favor because it is wrongly applied, and

under such conditions, he says, it can produce disastrous results. Cold is applied early to prevent the blood vessels of an inflamed area from becoming dilated and hence to limit diapedesis and escape of plasma into the neighboring tissues; to accomplish this, applications of cold should be continuous and applied as soon as possible after the injury. "The beneficial effect of cold does not cease after the early stages of inflammation have been reached. It can be continued with great advantage, if necessary, all through the process, as can be proven by clinical experience." He regards cold as an antiseptic on account of its retarding influence in the growth of bacteria. He denies that healing is retarded and absorption of inflammatory products interfered with or that this agent becomes the source of annoyance to the patient, but claims just the opposite of these effects.

SUBCONJUNCTIVAL INJECTIONS IN THE TREATMENT OF EYE DISEASES.

William Ellery Briggs, M. D., Sacramento, Cal., (*The Journal of the A. M. A.*, September 15, 1894). The writer, having watched Drs. Darier and Abadie use conjunctival injections of mercuric chlorid solutions, became convinced that good results were obtained in a certain number of cases; he has treated quite a number of cases of which many did better than they would under other treatments alone. Most of the cases were of septic or syphilitic origin, and other treatments were used in conjunction with the subconjunctival injections. He used three to five drops of a 1:2000 solution of bichlorid, repeating the injections two or three times a week. He observed Darier's rule that where improvement was not manifest after the tenth injection, no good need be expected from this method of treatment. The cases in which he found the method to do the most good were instances of syphilitic disease of the choroid and septic ulcers of the cornea.

THE SIGNIFICANCE OF ALBUMINURIC RETINITIS IN PREGNANCY.

Robert L. Randolph, M. D., Baltimore, Md., (*Bulletin of the Johns Hopkins Hospital*, November, 1894). The writer gives the histories of five cases of albuminuric retinitis in pregnancy and calls attention to the fact that much weight should be attached to the occurrence of dimness of vision at any time during pregnancy, and that this symptom and headaches may be the only suggestions of kidney trouble. He insists upon the necessity of terminating

pregnancy at once in cases in which the retina is very markedly diseased and speaks of Howe's statistics, which show that when labor was not induced and the woman escaped a fatal issue, permanent blindness was the result. In discussing the pathology, he says: "The blindness which is present in albuminuric retinitis is due to edema of the retina and consequent interference with the conductivity of the nerve-fibers."

An analysis of his cases led to the following conclusions: "(1) Visual disturbances occurring in the first six months of pregnancy, and especially when associated with violent headaches, frequently mean albuminuric retinitis, and if this condition is found, to save sight, pregnancy should be at once terminated. (2) Visual disturbances showing themselves in the last seven weeks of pregnancy, while indicating the same retinal lesion, are of less grave import in so far as sight is concerned, and unless these disturbances are very pronounced and associated with widespread ophthalmoscopic changes, should not in themselves call for the induction of premature labor, for here, their history goes to show that sight is completely restored after labor. This is especially true when the retinitis shows itself in the last two weeks of pregnancy. (3) The occurrence of renal retinitis in one pregnancy does not mean that the woman will be likewise affected in a subsequent pregnancy, and even though headaches be present and albumen be found in the urine, so long as the fundi are free from the usual signs of an existing albuminuric retinitis, the question of sight should not properly be considered."

THE PHYSIOLOGY OF CERTAIN OCULO-MOTOR PHENOMENA
WITH RESPECT TO SOME RECENT THEORIES
OF ASTHENOPIA.

F. B. Eaton, M. D., Portland, Ore. (*Journal of the A. M. A.*, September 1, 1894.) The main intention of the author of this paper is to show that a number of theories of asthenopia which have appeared recently have no real foundation, either in fact or according to the established facts and principles of physiology. As illustrative of his contention, he cites the theories of "insufficiency of the oblique muscles" and of their compensatory action in oblique astigmatism, as put forth by Dr. G. C. Savage, and describes a number of experiments of Le Conte and Meissner by which the fact of a physiological rotation of the eyes outward on the visual axis during convergence, was many years ago established, this phenomenon as evoked by prisms being the basis of

Savage's theory. He also shows that the same rotation was demonstrated by Hering, Volkmann, etc. The author demonstrates by drawings illustrative of his own experiments that in case of oblique astigmatism a rotation which would harmonize the horizontal meridians would render the vertical one proportionally less so. He concludes, therefore, that: (1) The phenomena included under the term "cyclophoria" are physiological, being the results of the normal rotation of the eyes in convergence. (2) The phenomena in no way disturb binocular vision, owing to the habitual toleration or neglect of the incoincident positions of the retinal images outside the immediate area of fixation. (3) A compensatory rotation of the eyes in cases of oblique astigmatism does not take place; if it did, it would defeat the very object for which it was invoked by the author. (4) If the laws of optics would permit the alleged correction, it would not be necessary or expedient, since it would render stereoscopic vision impossible.

The paper also criticizes the "Innervational Theory of Asthenopia" of Dr. Geo. M. Gould as being contrary to physiological facts and practical clinical experience, since physiologists agree that the relations existing between the nerve centers and muscles are not inflexible, while embryonic variations of the shape of the orbit and of the length-tension and insertions of the ocular muscles effect their innervation.

This method of prism-adduction is mainly serviceable in developing the positive portion of the relative range of convergence for distance; pushed far, it results in a true gymnastic exercise, but in many cases even where esophoria is induced, the dynamic convergence remains below the normal. In heterophorias complicated by vertical tendencies, the method is of no value, and in general it is but tentative.

THREE CASES OF STRABISMUS, WITH ANALOGOUS DIPLOPIA. AN ORIGINAL AND AN ACQUIRED FIXATION SPOT IN THE SAME EYE.

Charles Hermon Thomas, M. D., Philadelphia. (*Ophthalmic Review*, September, 1894, and *Transactions of the American Ophthalmological Society* for 1894.) Thomas recites three cases of squint in which the deviating eye possessed two fixation spots—one the normal macula, the other an acquired fixation spot; the former was used in monocular fixation only, the latter in binocular fixation only. These three cases (two divergent squint, the third, convergent) were operated upon; the cosmetic defect was

removed, but in no case was orthophoria attained. The writer believes the following inferences to be justified by the conditions present in these three cases: (1) **B**inocular vision—*oeil cyclopienne*—involves ~~an~~ additional cerebral function above and beyond that involved in monocular vision. (2) That corresponding points of the two retinae are in binocular fusion correlated with the functional fixation spot, whether that spot lies in the normal fovea centralis or not. (3) That suppression of the macular image during the act of binocular vision may take place, the image upon the false fixation-spot only being regarded while the macula has its usual predominance when the eye is used alone, *i. e.*, the false fixation-spot has now no longer greater prominence than a similar region of the retina in a normal eye. (4) The existence of an additional fixation-spot in strabismus is denoted when the affected eye, used alone, is seen to fix centrally and yet when, with prisms corrective of the deviation, as shown by the abolition of movement under the cover test, there occurs diplopia contrary to rule, *i. e.*, crossed diplopia associated with divergence, and *vice versa*. It will be seen that practical considerations of importance bearing upon the operative treatment of strabismus grow out of our recognition of the presence of two fixation-spots in the same eye.

AMETROPIA IN MICROSCOPIC WORK.

Capt. Charles E. Woodruff, Assistant Surgeon, U. S. A., Fort Sheridan, Ill. (*Journal of the A. M. A.*, November 24, 1894.) Capt. Woodruff does not discuss the question of asthenopia from microscopic work, but remarks that this is due to "bad light, bad position, congestion from obstructions around the neck, the habit of using the accommodation too much and unnecessarily and to other conditions, but is not due to the observer's errors of refraction." He demonstrates by drawings and by other methods of considering the optical principles of the microscope that "ametropes have clear vision in using the microscope without their correcting lenses, and that it is unfair to accuse an observer of incorrect observation because his refraction is not normal."

ABSTRACTS FROM FOREIGN CURRENT OPHTHALMOLOGICAL LITERATURE.

BY CASEY A. WOOD, C. M., M. D.,
OF CHICAGO.

THE USE OF FORMALIN—FORMOL—IN OCULAR THERAPEUTICS.
ITS EMPLOYMENT AS A PRESERVATIVE MIXTURE. RESTORA-
TION OF QUALITATIVE PERCEPTION OF LIGHT AFTER IRIDEC-
TOMY IN A CASE OF COMPLETE BLINDNESS FROM GLAUCOMA
SIMPLEX. THE CONJUNCTIVA AS A PROTECTIVE COVERING IN
EXTENSIVE WOUNDS OF THE CORNEA. THE CORNEAL SUTURE
AFTER CATARACT EXTRACTION. BILATERAL, CONGENITAL
PTOSIS ASSOCIATED WITH COMPLETE PARALYSIS OF ALL THE
EXTERNAL OCULAR MUSCLES.

THE USE OF FORMALIN—FORMOL—IN OCULAR THERAPEUTICS.

Of all the drugs recently recommended as of value in ocular therapeutics (methylic or) *formic aldehyd* ($C H_2 O$) calls for special mention. Guaita, of Siena, in a preliminary communication¹ on the subject says, "that in his hands it has proved of so much value that he hopes readers of his paper may join him in experimenting with it.

The *formol*, *formalin* or *formaline* of commerce (the only shape in which it can ordinarily be obtained), is a 40 per cent aqueous solution of formic aldehyd, containing also a little methylic alcohol. It is a colorless fluid with an empyreumatic odor, of the consistence of water and miscible in all proportions with that liquid. Although not very volatile it is better to keep it in tightly closed bottles because, like aldehyds generally, it is not a staple compound and readily breaks up into paraformic aldehyd and other compounds. Pure formalin mummifies and destroys the tissues to which it is applied. Touching with it the ear of a rabbit the skin at the point of contact will, after a time, be seen to separate from the surrounding parts, some suppuration will be noticed, and the animal shows signs of pain.

¹ L. Guaita. Il formolo in oftalmojatria. Nota preventiva, *Annali di Ottalmologia*, 1894, Fasc. 5, p. 360.

O. Löw first drew attention to the antiseptic value of this substance in 1880, and in the following year Buchner and Segall confirmed the disinfectant properties of the vapor of formic aldehyd. Later formalin came to be generally known as a preservative of both animal and vegetable tissues, and in 1893 Hermann recommended it in place of alcohol, Muller's fluid, etc. for preserving the enucleated eyeball. Leber, during the recent International Congress at Edinburgh, gave it as his opinion that for this special purpose it is superior to any other method.

Those who have experimented with formalin, in special reference to its disinfecting properties, have been deterred from using it as a remedy, both because of its destructive action upon the tissues and on account of the acrid and irritating fumes that arise from it. These objections are removed when the dilute solutions are used, and especially since Stahl has shown that properly prepared, it is not poisonous.

The first to point out the possibility of its use in ocular therapeutics were Valude and Dubief in a communication to the French Ophthalmological Society. They advocated it for sterilizing the conjunctival sac in chronic conjunctivitis with purulent secretion in ophthalmia neonatorum and for the prevention of post-operative infection. Beyond this mention of the remedy it has attracted very little attention, probably because of the large number of antiseptics recommended with a great flourish of trumpets, and found on investigation, to be of no particular value clinically. In laboratory work Guaita prefers Leber's formula. If an enucleated eye be immersed in a 10 per cent solution of formalin for twenty-four hours it will be hard enough to cut and will have retained its shape and size. Moreover, the tissues do not lose their color nor all of their transparency. This liquid is very diffusible and differs from many other preservative solutions in not coagulating albumen to any extent so that it readily penetrates to the interior of the specimen immersed in it. The same action is observed when it is applied to living tissues, and to this fact is probably due its superiority over other antiseptics. Another peculiarity of formol is the marked difference between the amount of it required to kill certain morbid germs (antiseptics), and solutions that render it impossible for them to develop (asepsis). Laboratory experiments gave the following results: A 5 per cent solution killed the cholera bacillus in three minutes, that of diphtheria in ten minutes, of carbuncle in fifteen minutes, the staphylococcus aureus in thirty minutes, and the carbuncular spores in five hours. A 1 per

cent solution took at least five hours to kill the staphylococcus aureus. As a preventative of fertilization, formol, even in very weak doses, is of signal value. According to the experiments of Trillat, Berlioz, Schmidt, and others, the smallest aseptic solution (varying somewhat with the bacteria under observation) was 1:20,000. The vapor arising from an uncorked bottle placed with a piece of meat in an inverted vessel was sufficient to delay putrefaction in the former for about a week. Pieces of fresh skin immersed in the very weakest solution absorb the antiseptic very rapidly, become "tanned," and do not decompose.

Coming to its application to the ocular tissues and its use as a remedy in diseases of the eye, Guaita has used formalin solutions to produce asepsis previous to operations, in suppurative keratitis, in granular conjunctivitis and in ophthalmia neonatorum. Solutions (distilled water only) should be recently prepared and kept in bottles fitted with a ground glass stopper. If this is not done the vapor will partly escape and partly decompose.

The best solution for irrigating the sac and for collyria is 1:2000. A solution of 1:1000 is an irritant and produces conjunctival hyperemia, while the weaker mixture is almost always readily tolerated. When the first few drops are applied a burning sensation is produced and this continues during irrigation also, but subsides immediately after the application ceases. Guaita thinks that the formol solution possesses anesthetic qualities as it appears to make the eye less sensitive to operative treatment than when the sac is irrigated with other simple fluids, such as distilled water or the physiological solution of common salt.

Comparing the condition of the conjunctival sac (previous to operation) after disinfection by various agents the writer finds that formol has much to recommend it. The experiments carried out in his own clinic were made on the evening previous to as well as a few minutes before operating on the eye. The lids and cilia are first cleansed by thoroughly rubbing them with pieces of sterilized gauze soaked in a 1 per cent solution of sodic carbonate.

The irrigating fluid is then directed upon the eyeball and into the sac from a sterilized bottle sufficiently elevated above the patient's head to give force to the stream. This is continued for four or five minutes so as to ensure complete lavage of every part of the sac.

The surface is now examined for micro-organisms as to whether the cleansing has been effective or not. In this way it was found that boric acid, salicylic acid and sublimate, (in the strength of

1:2000), gave results which are not much more satisfactory than those obtained from using sterilized water or the physiological salt solution in the same way. Immediately after lavage with the sublimate solution the sac was generally found to be sterile, but after a few hours an abundant supply of cocci appeared. This meant, probably, that the bichlorid being an irritant, stimulated secretion and exudation, thus furnishing nourishment for the infant colonies.

With formol Guaita has, so far, obtained better results, the conjunctiva remaining practically sterile (so far as pathogenic bacteria are concerned) for more than twenty-four hours after washing it out.

During and after an operation upon an eye that has been disinfected with the formol solution, there was a noticeable absence of the pain and burning which are often observed in such cases. In addition to this evidence of the anesthetic action of formalin previously noticed, the ocular surfaces were usually found to be pale, smooth and without the least trace of abnormal secretion—conditions most favorable to the maintenance of a practical asepsis.

In suppurative diseases of the cornea formol possesses the property of being more diffusible than most other antiseptics—a signal advantage in dealing with tissues deep into which micro-organisms so readily burrow, out of reach of germicidal agents. In one case in which sublimate solutions failed to put a stop to the progress of the disease, the author promptly succeeded in checking it by touching the ulcer with a 1:100 solution of formol, followed by the usual irrigations of 1:2000.

In trachoma Professor Guaita believes that from rubbing the everted lid surface with gauze sponges immersed in formol 1:400, followed by irrigation with 1:2000 every two hours he obtains, on the whole, better results than from the employment of sublimate in the same way. In two cases of pannus, suitable for treatment by jequirity, the author was able to obtain a similar reaction with formol.

Guaita has also demonstrated its value in the purulent ophthalmia of the new born. In two very severe cases (opaque corneæ with beginning ulceration, pseudo-membrane of conjunctiva, etc.,) where silver nitrate and iodoform ointment failed to act satisfactorily, formol was applied for three days in the same manner as for trachoma. The corneal ulceration was arrested, the infiltration soon decreased, and the false membrane entirely disappeared.

The author, in conclusion, hopes that his expectations regarding formol will be realized and that it will be found to be valuable both to the general and to the ophthalmic surgeon.

RESTORATION OF QUALITATIVE PERCEPTION OF LIGHT AFTER
IRIDECTOMY IN A CASE OF COMPLETE BLINDNESS
FROM GLAUCOMA SIMPLEX.

This is an interesting recital¹ of the case of a man, 30 years of age, who was seen by the author on August 26, 1893. He had typical glaucoma simplex in both eyes and had absolutely no perception of light. The failure of vision had commenced in one eye six weeks before and in the other two days earlier, and so rapid was the progress of the disease that both eyes became blind in three weeks. On August 27 iridectomy was done in the hope of anticipating the pains that usually came on in the blind eyes of these patients. Dr. Kugel was, however, astonished to find, on August 30, that the patient was able to perceive light, and that three days later his right eye saw hand movements, while with the left eye fingers were counted at 40 cm. During the following eight days a very sight improvement was noticed. Encouraged by his success thus far Kugel, on September 12, did a second iridectomy. On September 26, V. R. = fingers at 10 cm.; V. L. = fingers at 1 m. On November 5, when the patient left the hospital, the condition of the left eye had still further improved; V. L. = fingers at 1 m. 20 cm. The F. of V. of both eyes showed a decided contraction, more pronounced in the vertical than the horizontal meridia. The difference in the ophthalmoscopic findings before and after the operation was very pronounced. When first seen patient showed deep papillary excavation, the central vessels were pushed towards the temporal margin of the nerve and a marked bluish discoloration of the disc was readily made out. Just before leaving the hospital the vessels had resumed their normal position in the left nerve head and in the right their malposition was less noticeable. The blue appearance of the papilla had given place to a whitish tint on the right side and to the normal coloration in the left eye. Even the excavation had almost disappeared on the left side and was not so marked on the right. Pulsation of the retinal vessels had ceased and the greatly increased tension, previously felt in both globes, had subsided.

¹ L. Kugel. Ein Fall von Rückkehr qualitativer Lichtempfindung nach Iridectomie bei Amaurosis in Folge von Glaucoma simplex. Graefe's *Archiv. für Ophthalmologie*, Bd. 40, III, 1894.

We do not usually expect to have even a faint return of light perception in blindness from glaucoma simplex, that phenomenon being reserved for the very acute forms, the so-called *glaucoma fulminans*. Moreover, cases like the foregoing are the very ones that are not commonly helped, so far as vision is concerned, by iridectomy or similar operations. It is remarkable how greatly the local lesions improved and, by no means least, how rapid was the loss of vision (fourteen days) after the attack began.

THE CONJUNCTIVA AS A PROTECTIVE COVERING IN EXTENSIVE WOUNDS OF THE CORNEA.

The writer¹ quotes Snellen as recommending a conjunctival flap for the purpose of covering wounds of the cornea and sclera, the mucous membrane being retained in its new position by sutures. This, de Wecker says, is readily accomplished where the wound is in the sclerotic and situated a distance from the corneal margin, but how can we follow Snellen's advice when the wound is in the cornea? Another objection is the friability of the conjunctiva and the likelihood of the stitches tearing through before the wound beneath is healed. To accomplish the object last named it is necessary to hold the conjunctiva in place for from six to eight days, and this is best obtained by temporary but complete conjunctival occlusion of the cornea.

de Wecker advises his plan to be used only in the case of extensive corneal injuries where one lip of the wound tends to separate from or overlap the other. In such instances we should, in addition, use slight pressure as most likely to keep the wound margins in apposition.

He carefully detaches (beginning at the sclero-corneal junction) the conjunctiva from the sclera all about the margin of the cornea as far back as the insertion of the recti muscles, including in the flap as much of the *sub-mucosa* as possible. The membrane is now reunited *across* the cornea (exercising as much pressure as is required) either with a purse string suture or by four to six vertical stitches—always remembering to include the subconjunctival tissue so as to prevent the stitches from being torn out.

In this way the cornea is entirely covered up and the palpebral edges and cilia having been thoroughly disinfected a bandage is applied and for eight or ten days, during which time the suture threads, themselves thoroughly disinfected, become detached spontaneously.

¹ de Wecker. *Traitement des blessures de la cornée par l'occlusion conjunctivale. Annales d'oculistique*, November, 1894, p. 293.

The operator who makes use of this procedure for the first time may, perhaps, feel uneasy as to the outcome of the operation, but he may be assured that the conjunctiva will be certain to detach itself once more from the cornea except at the line of the wound—just where it is required.

In this manner many eyes, apparently doomed to destruction on account of very large penetrating injuries, may be saved. The patient should be anesthetized and the plan above laid down followed as soon after the accident as possible—without paying much attention to deeper lesions, such as traumatic cataract or luxation of the lens. These can be treated subsequently. Subsequent keratoscopic examinations will usually show how slightly the corneal curve has been affected in cases where this method has been applied.

The author has derived signal benefit from this drawing over of the conjunctiva in conjunction with partial ablation of staphyloma anterius. Here the conjunctiva adheres only at the cut margins of the staphyloma. The translucent mucosa permits not only a slow filtration of interior fluids from the eye, thus relieving the glaucomatous tension so often present in these cases, but it also acts as a sort of artificial pupil.

This temporary conjunctival occlusion has to recommend it facility of execution; it is not subsequently painful and it leaves no trace of the operation upon the globe.

THE CORNEAL SUTURE AFTER CATARACT EXTRACTION.

In the last number of Knapp's *Archives of Ophthalmology* there is an admirable translation by the senior editor of a contribution to the *Archives* by Dr. Kalt. Practically the same paper¹ was published in Paris with a few additional sentences that did not appear in the English journal. As they form a part of the argument, *pro*, I quote them, as follows: "One objection often raised is this: 'Your suture complicates an operation that is otherwise beautifully simple.' No doubt! It takes two or three minutes to put in the stitch and to sew up the wound, but how about the dangers that are thereby avoided? While every conscientious surgeon exposes his patient to the fewest risks possible, we oculists still persist in abandoning our large corneal wounds to the mere chance of an intraocular hyper-secretion. I conclude with the

¹ De la suture cornéenne après l'extraction de la cataracte. *Archives d'ophtalmologie*, October, 1894, p. 639.

words of a most excellent surgeon, but one little versed in ophthalmology. I had just completed, in his presence, an operation for cataract. I asked him if it did not appear strange to him to see me stitch the corneal incision, contrary to all the ordinary methods. 'Not at all,' said he, 'it appears quite natural to me: you have made a wound and you close it up. Anything extraordinary about that?' "

BILATERAL, CONGENITAL PTOSIS, ASSOCIATED WITH COMPLETE PARALYSIS OF ALL THE EXTERNAL OCULAR MUSCLES.

This rather rare condition of the ocular apparatus is well illustrated in the following case-history:¹ S. K., boy, 15 years of age, had always been healthy and strong. His upper lids had drooped since infancy and appeared to become thick and swollen as he grew older.

The left interpalpebral fissure measures only 2 mm. at its widest part: the right, 5 mm. The left lid covers the whole of the pupil, only a small portion of the iris being exposed. On the right side a segment of the pupillary area 1 mm. wide is seen. If the right eye be closed the patient can see a little by tilting the head backwards and drawing up the skin of the forehead as high as possible, but in spite of these exertions the lids cannot be raised to any extent. V. = $\frac{2}{3}$ u. o., and J. I. easily. Fundi normal; direct and consensual pupillary reaction good. The left eye is slightly divergent. The excursion of both bulbs is almost completely abolished; it is only with the greatest exertion that the eyeballs can be rotated a degree or two in any direction. In attempts to read, the patient makes use of his right eye only.

The following operation (after Birnbacher) was performed in this case: An incision, corresponding to the upper convex border of the tarsus, was made through the palpebral skin the whole length of the upper lid. After the removal of the subcutaneous fat, which in this instance was considerable, an oval piece of superfluous skin was also excised. The upper border of the tarsal cartilage having been laid bare, three strong double-needled threads were passed through it (one in the center of the wound, each of the others on either side, 7 mm. from it) and securely knotted. Each of the six needles was then pushed up under the skin to the eyebrow, where they emerged at regular inter-

¹G. Ahlström. Doppelseitige kongenitale Ptosis und Unbeweglichkeit der Bulbi. *Deutschmann's Beiträge zur Augenheilkunde*, XVI Heft, 1894, p. 51

vals. By carefully pulling upon these threads the tarsus and lid were sufficiently elevated and the threads tied in pairs over three pieces of small-sized drainage tubing. A couple of superficial stitches brought the edges of the skin wound together. The deep sutures were allowed to remain *in situ* for seventeen days. The ptosis was now fully corrected and there has so far been no relapse. Through his frontalis muscle the patient has considerable control over his upper lids, the explanation of which lies in the fact that one can readily feel on each side thick and broad cicatricial bands stretching from the eyebrow to the upper edge of the tarsus.

The writer thinks the central lesion in this case extends from the posterior part of the third ventricle, along the sylvian aqueduct to the parts beneath the fourth ventricle.

The patient did not complain of diplopia after the operation, nor can double images be readily induced by the usual methods. In doing near work he invariably fixes with the right eye and when it is closed he turns his head toward the right to bring the left eye into a position where he can fix the object.

A CASE OF ACUTE PURULENT INFLAMMATION OF
MIDDLE EAR WITH TWO ATTACKS OF DOUBLE
OPTIC NEURITIS, NO MASTOID COMPLICA-
TION, FREQUENT DELIRIUM, TWO
OPERATIONS AND RECOVERY.

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IT seems to me that all interesting otitic cases of value such as I am about to relate should be reported, so that all new signs, phenomena, etc., may be noted and be of value to some one in making up intelligent diagnoses of cases, for it is only by a summary of such collective investigations that we arrive at definite conclusions.

With this end in view, I present the following history of a very interesting case:

Miss E. F., a domestic in my own family, while visiting her friend on October 29, 1892, slept in a cold room which she was not accustomed to doing, and contracted a severe acute rhinitis, which I treated with apparent success, but on Sunday, November 14, 1892, an acute inflammation of left middle ear set in with intense pain, which was not alleviated even after puncturing the tympanic membrane on November 20th, and giving vent to considerable pus, but continued every night and most of the day, necessitating the use of narcotics for about five weeks, up to the time of the first operation.

During this time the continuous use of hot boric acid solutions with insufflations of boric acid, thoroughly cleansing the parts several times a day was kept up, but all without avail, the pain was constant, as well as a continuous profuse purulent discharge, notwithstanding the daily use of the Eustachian catheter to thoroughly keep clear the Eustachian tube and tympanic cavity of the constantly forming purulent discharge. Her H. D. = ordinary voice at three feet only in this ear. She now began to have numerous attacks of inflammation of the auditory canal, which generally yielded to the application of oxid of zinc ointment, and was no doubt due to the constant purulent discharge. December 20th, she began to complain of vertigo, stiffness of the muscles of her neck, partial paralysis of left side of face, difficulty of swallowing, stiff tongue, pain in pharynx, and impaired sensation of taste. Pulse ranging from 90 to 120, temperature 99° and

occasionally subnormal, and at no time above 99.5°. Delirium now began to be a daily symptom lasting from ten to fifteen minutes at a time, with intervals of an hour or two when she was rational. December 23d, her vision now began to fail her in each eye. During a rational interval I took her distant vision which equalled $\frac{2}{20}$ in each eye. Diplopia was a frequent symptom although not constant. The ophthalmoscope showed both optic discs swollen to the extent of 3 D.; their outlines were not discernible in the least. Pain in both ears excruciating, also in region of cerebellum, sensation of falling backwards, some tenderness along veins of neck, right ear also began discharging freely, but soon subsided under the use of hot boric acid injections. There seemed to be a great deal of tenderness over left mastoid region, but without any inflamed or edematous condition. Taking into consideration all these symptoms an operation seemed inevitable, or death would soon be the end of my patient.

On Sunday, December 25th, I removed her to the hospital where, after a consultation, and by the assistance of Drs. Funk, Coover, Gorgas, Ellenberger and James, I decided to open the mastoid process, and do such other exploratory operative procedures as would be deemed necessary. After using thorough antiseptic measures the mastoid was laid bare, but as it appeared so very healthy I concluded to use one of Buck's drills first for exploratory purposes, and then if necessary do the Schwartze operation. After drilling into the antrum I found no pus there, but everything in a healthy condition, when suddenly an immense quantity of pus flowed from the auditory canal which had been previously thoroughly dried out. There was apparently no discharge the entire day preceding the operation. Taking into consideration the healthy condition of the parts, and the profuse flow of pus through the auditory canal, I decided not to proceed any further with the operation. The wound was packed with iodoform gauze, carefully bandaged, and I decided to wait for further developments. Her temperature was 99° before the operation and 98° an hour afterwards.

The pain in the ear through the temporal region and at the base of the brain ceased gradually. The wound was dressed after forty-eight hours and regularly every three or four days for three weeks, the entire time she was in the hospital. She was given 10 grains of potassium iodid three times a day for the optic neuritis, and when she left the hospital at the end of the third week feeling perfectly comfortable, her vision equalled $\frac{1}{10}$ partially in each eye. She returned to my residence and began her regular domestic work, and for almost a year was perfectly comfortable except an occasional attack of pain followed by a very offensive discharge of pus. During December, 1893, up to February, 1894, she had a continuous purulent discharge with frequent attacks of a very intractable inflammation of the auditory canal, resulting in several attacks of erysipelas inflammation which extended over her entire face. The powdered oxid of zinc applied frequently, the erysipelas soon subsided.

She suffered intense pain during the entire three months in the back of her head, in the left ear (the same one I had operated on), and through the temporal region. The second attack of optic neuritis now began to such an extent that her vision diminished to $\frac{1}{100}$ in each eye. Several attacks of delirium followed by coma, lasting from ten to fifteen minutes at a time; subnormal temperature, ranging between 97° and 98°. Profuse

purulent discharge and diplopia were urgent symptoms which to me seemed to indicate a second operation.

On February 12th, I again removed her to the hospital with the determination to clean out the entire middle ear or whatever seemed necessary to effect recovery if possible. Under ether I thoroughly curetted the tympanic cavity, removing the incus and malleus which were carious and easily removed. At several places the temporal bone was denuded, but after packing it with equal parts of iodoform and boric acid for several days the discharge entirely ceased. I kept my patient lying on her left side so as to favor drainage as much as possible, and in one week's time pain had ceased, the delirium gone, and she was again ready to return to her work as one of my domestics.

I put her on iodid of potassium and strychnin for about two months, which gradually improved her optic neuritis and vision to $\frac{1}{10}$ for a while, but subsequently diminished to $\frac{1}{8}$ in right eye and $\frac{1}{10}$ in left eye.

Her vision at this writing remains at that; she has had no pain or purulent discharge from either ear since the operation.

Both optic discs appear quite pale, which is, no doubt, a sequela of the two attacks of optic neuritis. It is now ten months since the operation and she is in better health now than she had been in two years.

H. D., R. E., = $\frac{1}{10}$; H. D., L. E., watch on contact only. R. E., H. D., = ordinary voice at 20 feet; L. E., H. D., = ordinary conversation at 8 feet.

In looking up the literature upon this subject I find that Dr. Charles J. Kipp, of Newark, N. J., reports a case to the American Otological Society in 1892, which in very many respects is like mine, yet it differs from mine considerable. His patient had good vision during and after the attack of optic neuritis, my case did not have good vision, and in addition had diplopia with the second attack, and has finally resulted in some general atrophy. The mastoid in his case was not tender upon pressure and contained foul pus, while my case was very tender upon pressure, but contained no pus.

The optic neuritis in Dr. Kipp's case began six weeks after he first seen the case, and in my case it began five weeks after the ear trouble began. There seems to be no appreciable difference in the temperature records of our cases. Cases of optic neuritis are rare that occur within four to six months in acute or chronic cases, and I can find none on record except Dr. Kipp's case. I have never seen or read of a case of acute or chronic suppuration of the middle ear accompanied by two attacks of optic neuritis. A marked symptom in this case was the continued delirium during an entire week preceding the first operation, and for almost two weeks preceding the second one. She quite frequently would get up out of bed at night and then fall into a stupor requiring quite an effort to arouse her. The pain seemed incessant.

I never saw a case that suffered such intense and constant pain as this one. It seems to me there is no doubt that the septic matter was conducted by the blood vessels running from the middle ear (a phlebitis of diploetic veins), directly to the parts affected. Did the first operation indirectly cause the profuse flow of pus through the auditory canal? I think it did.

It seems to have had a revulsive effect upon the middle ear, and my patient undoubtedly improved immediately after the operation.

Dr. Allen¹ says: "We frequently meet with acute cases where the operation, even when made under proper indications, reveals a perfectly healthy bone. This should, however, never prevent us from making an exploratory opening into the antrum and cells, as the effect on the patient of operating on the bone (under thorough asepsis) is little greater than that arising from the periosteal incision, and at the same time the operation exercises a certain revulsive effect on the middle ear suppuration." In a similar case hereafter, I would first thoroughly curette and clean out the middle ear.

Had I done that at first, a second operation I have no doubt would not have been necessary. This case seems to show the necessity of first curetting and thoroughly establishing drainage through the middle ear in suspected cases of cerebral complications before opening the mastoid or skull proper. Under similar circumstances, I think most any surgeon would have done just as I did. As a question of diagnosis, we all thought it one of mastoid complication and septic infection, with a possible cerebral abscess or sinus thrombosis. If it was not a case of direct septic infection I am unable to diagnose it. In support of our opinions I present the following references:

Oliver & Cleveland² says, "That optic neuritis is to be considered positive evidence that the inflammatory process has invaded the cranial cavity."

Politzer³ says, "that septic material in some cases is carried into the circulation direct from the cavities of the temporal bone."

Heiman,⁴ of Warsaw, says: "Abscesses are rare after acute inflammation of the middle ear, and mostly develop in case of chronic otorrhœa."

The same author⁵ says: "optic neuritis and paralysis of the extremities may be noticed in suppurative otitis, and that the differentiation of an otitic brain abscess from otitis media suppurativa is often difficult, as many general brain symptoms may be produced by an otitis. He believes that the difficulty in diagnosis

is not so because an aural suppuration runs a course simulating that of brain abscess, but that brain abscess in some stages may not reveal itself, and may show only such symptoms as may be attributed to the existing aural inflammation." To show the rarity of cases of optic neuritis from direct septic infection from the tympanic cavity, the following cases go to show that they are most always due to other cerebral complications:

Edmunds⁶ shows that of twenty cases, thrombosis, meningitis, temporosphenoidal abscess, cerebellar abscess; fifteen had either single or double optic neuritis.

Patterson⁷ reports twenty-five cases of pappillitis, but all from brain abscess and sinus thrombosis.

Ballance⁸ reports a number of cases from sinus phlebitis.

Ferrier,⁹ Parker,¹⁰ Barr,¹¹ Greenfield,¹² report all their cases due to cerebral abscess and sinus thrombosis.

Kellar¹³ noticed abducens paralysis in one or two cases.

Kipp¹⁴ and Pomeroy¹⁵ report three cases of purulent iridochoroiditis supposed to be due to septic emboli carried from ear into the choroidal vessels.

CONCLUSIONS.

This case demonstrates the following conclusive remarks:

1. We may have optic neuritis in the early stages of acute purulent inflammation of the middle ear, and that the ophthalmoscope should be used in all acute and chronic cases of otitis media.
2. That symptoms simulating cerebral abscess and sinus thrombosis may be produced by direct septic infection from the middle ear.
3. That one should establish thorough drainage in all acute cases, and that if after the acute symptoms have subsided, and all treatment of no avail, and the purulent discharge is not arrested, curette the tympanic cavity, and in most cases you prevent further infection.
4. That when you have symptoms simulating cerebral abscess, etc., as in this case, errors of diagnosis are liable to occur, and as a precautionary measure, first curette and clean out all carious and necrosed ossicles, and diseased adventitious matter, and you may not need any further operative measures. When curetting, etc., of the tympanic cavity does not arrest the discharge, and you still have cerebral complications, open the mastoid regardless of it being tender upon pressure or not, and if this is still of no avail, then open the skull as per indication of symptoms.

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THE INFLUENCE OF AFFECTIONS OF THE UPPER
AIR-TRACT UPON THE EAR.BY H. A. ALDERTON, M. D.,
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ONE may believe a certain idea to be correct, but unless he adduces firmly established facts in its support he can hardly hope to gain the adherence of other investigators to his belief. The old saw that nothing lies so much as figures, except it be facts, has become so trite an argument against statistical productions that one is apt to lose sight of the other saying in regard to the choice of the lesser of two evils, and certainly as between impressions and an attempt at reasoning from facts the choice is not difficult. Light is vouchsafed to genius occasionally as the result of impressions, but for the average observer deductions from facts prove the better and surer road. There is a well defined opinion pervading the otological world that a great many aural troubles are either the result of or aggravated by pre-existing nasal or naso-pharyngeal diseases. With certain affections, *e. g.*, adenoids, etc., this is demonstrably true. How far it is true in regard to the less well-marked affections, this article is an attempt at answering. The following assertions are based upon the examination of about five hundred dispensary aural patients, by both anterior and posterior rhinoscopy, made at one sitting, the probe and cocain being employed to supplement the vision in all doubtful cases.

Out of 72 cases of *ceruminous impaction*, only 5 had nose, naso-pharynx and pharynx all normal, 22 had structurally normal nasal chambers, but more or less trouble with the naso-pharynx or pharynx, 9 suffering from coryza; in 3 other cases the naso-pharynx and pharynx were normal, the nose alone being involved. The 42 cases remaining had well marked naso-pharyngeal processes.

In 12 cases of *otitis externa acuta*, the entire tract was normal in 5, one other having adenoids only, another coryza and a third a history of injury from sea bathing. The 5 cases left were pathological.

Forty-three cases of *tubal obstruction and catarrh* showed only 1 case with the naso-pharyngeal passages normal; 28 had structurally normal nasal passages; 15, however, having coryza, while 20 had structural changes in the naso-pharynx (adenoids, enlarged tonsils, etc.), the remaining cases, except the one normal case above mentioned, having some local disease (hypertrophy, atrophy, etc.); 8 of the cases with normal nasal passages had previously been victims of whooping-cough, measles, scarlet fever, or diphtheria, 7 at the same time having adenoids, together with coryza in 3. In the 15 cases remaining with decided nasal disease, 10 had adenoids, 4 of whom were survivors of scarlet fever, measles, or whooping-cough.

In 19 cases of *otitis media catarrhalis subacuta*, 2 possessed normal naso-pharyngeal cavities, 7 had structurally normal nasal passages, but were suffering from coryza, 1 also giving history of trouble from sea bathing; naso-pharyngeal affections existed in the 10 remaining cases coincident with acute rhinitis in 4 and sea bathing in 1.

The examination of 16 cases of *otitis media catarrhalis acuta* showed only 1 case with a normal naso-pharyngeal tract, the nose being structurally normal in 8, these, however, all having coryza, with whooping-cough in 1; 1 case, otherwise normal, had adenoids; 6 cases had evident naso-pharyngeal lesions, with adenoids in 1 case.

Of 48 cases of *otitis media purulenta acuta*, 21 were with noses structurally normal, 5 of these having a normal naso-pharynx also, the rest with coryza, in 1 case combined with injury from sea bathing—none of these cases had previously had any constitutional disease; the 27 cases with abnormal nasal passages had present acute coryza in 10 cases, with sea bathing in 1 and the snuffing of water in 2 (none of these last having had any constitutional disease previously), 5 of the remaining cases had recovered from scarlet fever, measles or diphtheria.

There was no normal naso-pharyngeal tract in 20 cases of *otitis media purulenta recurrens*, though 6 were structurally normal as to the nose and 4 as to the naso-pharynx, these not occurring in the same persons, 2 of the former having coryza; 14 cases had well marked nasal disease, together with sea bathing in 1, measles in 2 and coryza in 8.

In 83 cases of *otitis media purulenta chronica* there were 9 perfectly normal naso-pharyngeal cavities without the history of any pre-existing constitutional disease; 20 cases with structurally

normal nasal passages, 9 also having coryza, 4 of the 20 having normal naso-pharynxes, but these 4, with 3 of the others, having previously had either measles or scarlet fever; 54 cases had nasal trouble, the naso-pharynx being normal in 9, coryza co-existed in 6, 18 gave constitutional disease as the cause, 2 sea bathing, in one combined with adenoids, in the other with influenza.

Only 1 case with perfectly normal naso-pharyngeal tract could be found in 31 cases of *otitis media purulenta residuosa*, 10 others having structurally normal nasal passages, but afflicted with coryza in 3, and with a history of measles or scarlet fever in 4; 20 cases had pathological conditions present, 4 giving history of pre-existing constitutional disease.

In 28 cases of *otitis media chronica catarrhalis* the nose and nasal pharynx were normal in 3, one of whom had recently had the influenza; in 5 other cases with structurally normal noses, 2 had coryza, 1 typhoid fever and diphtheria and 1 influenza; the 20 remaining cases having nasal disease had normal naso-pharynxes in only 3 cases, 7 had or were subject to coryza, none had previously any constitutional trouble.

Of 74 cases of *otitis media et interna*, 9 had normal naso-pharyngeal cavities, one of these attributing the trouble to pregnancy, another to scarlet fever and one to measles; in 18 cases structurally normal nasal passages co-existed with either abnormal naso-pharynxes or acute coryza or both, 5 cases also having previously had constitutional complaints that might have been causative; the 47 cases with nasal disease showed 8 with normal naso-pharynxes* and 4 with histories of constitutional disease (syphilis, etc.).

In 42 cases of *otitis interna* there were 6 cases with perfectly normal naso-pharyngeal cavities, 1 with coryza only and 3 with the naso-pharynx slightly affected only; there were 32 cases, mostly of slightly marked nasal disease, 7 of these having normal naso-pharynxes, 5 coryza and 4 with constitutional disease capable of producing the lesion.

CONCLUSIONS.

Ceruminous impaction. In 33% the naso-pharyngeal tract was not sufficiently involved to excite reflex irritation, in 66% the irritation may have been a factor, while in 40% of these it was probably influential.

Otitis externa acuta. In only 16% was it possible that the naso-pharyngeal processes could have exerted any effect.

Tubal obstruction or catarrh. Showed only 2% existing independently of naso-pharyngeal trouble; 88% were surely the result of naso-pharyngeal disease and 10% partly.

Otitis media catarrhalis subacuta. In 16% no naso-pharyngeal influence could be traced; 58% were surely and 26% probably in part due to naso-pharyngeal disease.

Otitis media catarrhalis acuta. No visible naso-pharyngeal cause in 6%, certainly causative in 81% and probably in part in 10%.

Otitis media purulenta acuta. The naso-pharyngeal disease was not sufficient in 10% to cause the aural complaint; 50% were due to naso-pharyngeal disease alone, 21% partly due to it, and 19% were produced by other causes entirely.

Otitis media purulenta recurrens. In 60% the naso-pharyngeal condition was directly responsible.

Otitis media purulenta chronica. Eleven per cent showed no naso-pharyngeal irritation, 35% were directly due to naso-pharyngeal influences, 30% to contagious diseases principally, 24% being partly due to naso-pharyngeal influences.

Otitis media purulenta residuosa. Sixteen per cent were free from naso-pharyngeal causation, 42% were caused by naso-pharyngeal disease, 29% were probably partly due to naso-pharyngeal disease, and 13% were probably not influenced by the naso-pharyngeal condition.

Otitis media catarrhalis chronica. No naso-pharyngeal trouble in 18%, 57% almost certainly caused by it and 25% partly.

Otitis interna et media. Twenty-six per cent were mainly due to other causes, the naso-pharynx was partly to blame in 36%, and in 38% the effect was doubtful.

Otitis interna. Twenty-five per cent could have no bearing upon the ear trouble, and only 14% had sufficient naso-pharyngeal trouble to have rendered possible any extension to the middle ear and beyond.

The more marked ear trouble existed upon the same side as most of the naso-pharyngeal disease in 91 cases, and upon the opposite side in 70 cases. In 47 cases the naso-pharynx was normal. Both sides of the naso-pharyngeal cavities were affected, only one ear being involved in 115 cases. Both ears equally involved, one side of naso-pharynx more than the other, in 47 cases.

Thus we see that in external ear troubles, especially cerumen, the condition of the naso-pharynx has a slight influence; in

middle ear affections the condition of the naso-pharynx exerts a great influence upon the aural processes (being directly causative in from 35% to 88% and partly in from 10% to 29%), in otitis media et interna the naso-pharynx was partly to blame in 36%, in otitis interna only 14% could possibly have exerted any influence. The special bearing of greater involvement of either side of the naso-pharyngeal cavities seems not to be of much importance as to its influence on the corresponding ear.

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TUBERCULOSIS OF THE TEMPORAL BONE. EXTENSION OF THE TUBERCULAR INFLAMMATION TO THE BASE OF THE TEMPOROSPHENOIDAL LOBE.

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POST MORTEM in tuberculous patients one not seldom finds meningeal and brain tuberculosis in the neighborhood of tuberculous destruction of the temporal bone. They generally occur simultaneously with deposits elsewhere, it being often impossible to locate the primary lesion.

In other cases, the infection of the skull-contents apparently is consequent upon disease of the temporal bone, as when the carotid canal is exposed by destruction of bone, the walls of the artery affected, and the germs of miliary tuberculosis are only distributed in the district supplied by the arteries of the Sylvian fossa. This contention is assured, when no other colony, that could be answerable for the infection of the pia, can be found in the body outside of the tuberculosis of the temporal bone. Should the bone disease extend to the sinus or the upper part of the bulbus jugularis, the tubercular germs may be scattered throughout the body by the veins. They attack, for the most part, the lungs, and in no such case, to my knowledge, has the tubercle been found in the pia or in the brain.

The extension of the tuberculosis of the temporal bone to the neighboring parts of the brain through contact, without the mediation of the large vessels, seems seldom to occur. I found only two such cases in literature, and I therefore report one of my own. Evidently the reason of this rarity of origin is that in temporal tuberculosis the air soon gains entrance through the ear and leads to a mixed infection which more quickly and easily produces purulent than tubercular infection of the brain and its adnexa, a fatal result taking place before brain tuberculosis has time to develop.

A Chinaman, 18 years of age, family presumably, and himself hitherto, healthy, attacked, without known cause, by pain in right ear in June, 1892; this decreased eight days later incidentally with a copious discharge of pus. Suppuration continued until the end of July when the mastoid region became swollen. I first saw the patient August 1, 1892. The swelling covered the whole mastoid, pressed out the auricle, and markedly fluctuated. Canal greatly narrowed by bulging posterior-superior wall, pus odorless. Normal temperature. Operated August 2, 1892. A fistula was found in the fossa of Bezold leading in a long softened bone to a cavity filled with granulations and bone fragments.

The antrum contained granulations.

Posteriorly the sinus transversus was found exposed for about 1 cm. and seemed normal. Syringed with sublimate solution, dusted iodoform, and applied gauze. Iodoform dressings regularly, but no healing occurred. The swelling in the meatus was repeatedly incised. November 9th, investigated cavity and found that the bone was still further involved in all directions, and this was removed. December 27th, removed still more unhealthy bone, laying bare the sinus, now covered with granulations, to a still greater extent. In spite of this the disease advanced. The bone deep in did not granulate. Towards the end of February, 1893, an abscess of the mastoid apex was opened by enlarging downwards the wound opening. On November 2, 1893, two pea-sized sequestra were extracted, followed immediately by vomiting, dizziness and facial paralysis. Four days later, upon removal of a third sequestrum, there occurred convulsions of the right half of the face and the facial paralysis became more marked.

The patient was remarkably long in coming out from the short and not deep anesthesia, had a few convulsions in the right leg and both hands, and was apathetic for the day.

Temperature, p. m., 38.5 C. Next few days no fever.

Patient then entered an institution and when I again saw him, the spring of 1894, was extremely emaciated and coughed. Complete facial paralysis. Operation; wound in same condition. The pus pulsated in the region of the sinus P. M. temperature 37.8 C. to 38.4 C. Bilateral apex infiltration of the lungs. No expectoration. It was not thought advisable to operate again.

In May, 1894, a. m. temperature 36-37 C.; p. m. temperature 38-38.5 C. Vomiting almost daily. May 25th, p. m., a heavy chill followed by fever of 39.2 C. A second chill May 29th, p. m. temperature rising to 40 C.; May 30th, a. m. sank to 35.2 C.; at

midday, after another chill, rose to 40.7 C.; evening 39.1 C., and on May 31st, a. m. 35.9 C. Chills on June 7th, 9th and 15th, with somewhat irregular fever between. Strength rapidly disappeared, frequent vomiting, slight cough, extremely little mucus expectoration, Pulse regular and about 100. A sensitive, swollen gland appeared under the angle of the lower jaw. He complained only of great weakness and frequent occipital headache. Occasional drowsiness in the beginning of July. July 9th, a chill. A painful, hard swelling extended from the angle of jaw to the middle of neck. Increased drowsiness; death July 31st.

Autopsy: Great emaciation. Considerable clear fluid in pericardium. Pleura adherent at pulmonary apices. In both superior lobes, small bean-sized cavities, peribronchitic indurations, and a few miliary tubercles. Spleen swollen. Isolated tubercles in kidneys. Brain, in taking out was torn over the right tegmen tympani. The attached portion to the tegmen measured about 4 cm. broad and long and 1-1½ cm. thick, a corresponding excavation existing upon the base of the temporo-sphenoidal lobe, extending up into the white matter. A thrombosed vein of the pia extended posteriorly from this defect and was bathed in pus. In both, especially the left, Sylvian fissures were countless tubercles on the pia. Both lateral ventricles were slightly distended by clear fluid. Otherwise the cerebrum and cerebellum were normal. The sigmoid portion of the transverse sinus contained pus. The superior petrosal sinus was thrombotic. The whole sigmoid fossa of the sulcus transversus was destroyed by caries and the sinus, covered with pale, firm granulations, projected deep into the destroyed bone. The tegmen tympani was largely destroyed. The dura is here much thickened, covered externally with granulations, in which are imbedded countless bone fragments. In a similar manner, the above mentioned piece of brain substance was adherent to the dura internally, the uniting mass of granulation tissue being strewn throughout with hemp-seed to pea-sized cheesy nodules. Mastoid process, canal, and tympanum form one great cavity filled with granulations and bone fragments, and the facial canal, cochlea, one part of the semi-circular canal, the fossa jugularis, and the lateral wall of the carotid canal are almost completely gone. The destruction was sharply limited to the temporal bone.

After removal of a pigeon egg-sized gland at the angle of the inferior maxilla, the jugular was exposed. It was filled with pus above, in the middle of the throat completely destroyed, and lost itself here in a somewhat hen-egg-sized abscess.

ON CHOLESTEATOMA OF THE EAR.

BY DR. B. BAGINSKY.

BERL. KLIN. WOCH., NOS. 26-27, 1894.

Translated and abridged by GEORGE MORGENTHAU, M. D., of Chicago.

The following views of the origin of cholesteatoma have been presented:

1. Virchow's, that cholesteatoma are heteroplastic tumors, and occur only as such.
2. The opinion shared by many aurists, and also some pathologists, that cholesteatoma are so-called retention products.
3. The dualistic interpretation according to which both are possible.

Cholesteatoma must be accurately defined.

Virchow demanded that a distinction be made between simple processes, *i. e.*, those in which cholesteatoma-like masses are shed; and those which are "true" cholesteatoma pathologically, *i. e.*, tumors with a delicate membranous envelope, epidermoidal formations and cholestearin contents. Lack of discrimination between the clinically observed products, and tumors found post-mortem appears to the author to be the main obstacle to reconciling these opinions. And from this point of view it becomes clear how the disharmony has increased in course of time. The author cannot doubt the occurrence of cholesteatoma as primary genuine tumors in the petrous bone, deferring to Virchow's specimens and the reports of post-mortem examinations published by many aurists. But this does not prove that Virchow's exclusive explanation is the only correct one.

The pathologist often meets with such processes when they are so far advanced and spread that he cannot distinguish between cause and effect. And it is not impossible and does not run counter to our accepted ideas, that different pathological processes result in the same or at least very similar products. It behooves us, therefore, to examine if those epidermoidal lamellæ which we get on irrigating suppurating ears and which we call cholesteatoma, are absolutely identical with the true V. C. found as tumors in post mortems. On regarding the products but superficially, both do appear very similar. but they are not identical.

The smaller lamellary masses, obtained by syringing, lack that external delicate membranous envelope (described by Virchow), which lines the bony cavities. Furthermore, in true cholesteatoma the central nucleus of pus (Eiterkern) (of which Von Troeltsch speaks) can hardly be found. Softened spots often occur in cholesteatoma, as is well-known, but these are not purulent masses which are centrally located and have become thickened, but are due to degeneration of the centrally located cholesteatoma cells. Wendt's theory as to the causative influence of an desquamative inflammation in the formation of cholesteatoma cannot be sustained either, because it does not explain the formation of an external membranous envelope and all the other conditions which constitute cholesteatoma.

Politzer describes nodules of epithelium as cholesteatoma, with which a more accurate contemplation cannot connect them. In Lucae's cases of granulation tumors with cholesteatoma, we are dealing with metaplastic processes of the surface epithelium, a sort of pachydermia which is not so rare in granulations; the lamellæ-like formations cover the granulations, and can be lifted from them rather easily. Microscopically only epithelial elements are found, and but little cholestearin; a membranous envelope has never been demonstrated, so that these formations should not be called cholesteatoma in the pathological sense. Habermann and Bezold advance the theory that cholesteatoma grow from without inwards, the epidermis extending through the perforated membrane into the antrum. Bezold does not accept this since Habermann too admits the existence of primary cholesteatoma in the petrous bone, it appears more probable that the epidermis of the cholesteatoma of the petrous or mastoid bone grows into the tympanic cavity, that the process extends from within outwards. The primary cholesteatoma of the antrum would, then, extend by the quickest and easiest way, that is through the "flaccid membrane" into the tympanum, and here cause inflammation with formation of epidermoidal products. So-called artificial cholesteatoma of Panse and Grünert cannot be adduced as proofs as the pathological examination shows them to have been cholesteatomatous masses. These cholesteatomata are produced by the extension of epidermis by the way of the canal made in a former perforation of the mastoid process and kept patent by a lead nail. Panse thinks these are cases of unintentional but successful implantations of cholesteatoma. The exact pathological examinations are lacking, and therefore, the cases cannot be adduced in proof of the theory. In

consideration of the persisting contradictions in explaining the origin of cholesteatoma and the difficulties encountered, recognizing the developmental stage of pathological processes from products already complete, the author attempts to clear up the matter through bedside observation and clinical results.

How then does the primary genuine cholesteatoma of the petrous bone present itself? Experience demonstrates that no specific symptoms need appear *intra vitam* which would point to cholesteatoma. Inflammatory signs of any kind on the tympanic membrane, in the antrum cavity, etc., may be absent; hearing is normal or at least not greatly impaired, and often the diagnosis is made many years later when the process, without suppuration or other inflammatory processes, breaks to the surface either through the mastoid or into the external meatus. Cases of this kind have been found by chance at post mortems and would undoubtedly increase in number if the temporal bone were examined more frequently. It must be, however, conceded that these cholesteatomata without symptoms are rare compared to the second kind which appear as chronic middle ear suppurations complicated with cholesteatoma or cholesteatomatous products. In this otitis media purulenta with perforation of the drum-membrane and granulation-tumors in the drum-cavity, cholesteatomatous products can be often removed in greater or smaller masses by syringing. There is, therefore, an undoubted relation between middle ear suppuration and such cholesteatomatous products. And Lucae believed he brought proofs that we are dealing with epidermis which is newly formed in otitis media purulent granulosa while the older strata are shed and retained in the cavities of the middle ear.

These chronic middle ear suppurations may be divided into two kinds which may, to be sure, occur together:

1. Suppurations of the tympanic cavity with granulations, and perforations in different parts of the membrane; often with complete loss of the membrane.
2. Suppurations of the cavity at the upper pole of the membrane with perforation of Shrapnell's membrane, through which whitish-grey lamellar cholesteatomatous products bulge into the external canal. In both forms caries can generally be demonstrated.

In the first group, the diagnosis "cholesteatoma," based solely on these epidermoidal lamellar products cannot, path-anatomically speaking, be sustained; certain characteristics of genuine cholesteatoma are wanting as we showed above, and it is known that similar products result from desquamative inflammations of the

cavity. Both parties may claim this field of discussion if they agree upon speaking of cholesteatoma wherever they meet with these epidermoidal formations. But they are not, in justice to the path-anatomical definition. The question also arises why these cholesteatomatous products result in these middle ear suppurations while metaplasia of the kind is not found in apparently identical diseases? An answer is impossible. In any case, however, these are not true neoplasms. In the second group the conditions are somewhat more complicated, and often can only be interpreted after the bony cavities have been brought to view by operation. There are chronic middle ear suppurations with perforation of Shrapnell's membrane in which peculiar secretory products of an epithelial nature appear, at first small in amount and not coherent, later in continuous masses with the character of cholesteatomatous products. Often nothing at all can be seen of the perforation till after the removal of the epithelial masses which have spread into the cavity or even fill it out. Now are these true cholesteatoma? Who ever considers the presence of such epidermoidal products sufficient for the diagnosis will always answer affirmatively, the cautious practitioner will answer only conditionally. Experience gained from post-mortems, and on living subjects when it was necessary to perforate the mastoid, to lay bare the malleo-incudal space and to remove the posterior wall of the auditory canal, show distinctly that many such cases were of real typical cholesteatoma with the path-anatomical characteristics which we consider essential. Cholesteatoma would seem a correct diagnosis, therefore in such cases. But it is not a positive one since in other cases, apparently similar clinically, we find only cholesteatomatous masses which we have described as not true cholesteatoma. In the beginning of the disease, on superficial examination, these cases can hardly be separated clinically; only the progress and further exact observation aid in arriving at a positive diagnosis. Cases with cholesteatomatous products may be cured by symptomatic treatment even if there is caries, provided the latter is not too extensive; while with true cholesteatomata, this is not true, as a rule. On the contrary they often spread in all directions and may, after attacking (corroding) the bones, take the well-known course, *i. e.*, break to the surface, press forward to the brain, invade it, and thus cause the most dangerous diseases which come to the notice of aurists. The typical character, therefore, of the existing disease, the peculiarity of its progress after operation, go to show that the conditions are extraordinary; and that these forms of

temporal and middle ear diseases may not safely be confounded with the common suppurations of the middle ear and the tympanic cavity. Habermann's explanations of this morbid process are not confirmed by clinical observation. It must appear strange that of the great number of middle ear suppurations, only in a small percentage of cases cholesteatoma-like products are found, and the question arises why these cases present such an extension of epidermis elements from the external canal and the drum-membrane and over the mucous membrane of the tympanic cavity into the mastoid process. Clinical observations do not give an answer even if we turn to Bezold's explanation. Tubal catarrh with swelling of the mucous membrane and retraction of the drum-membrane is so frequent and typical that other authors would discover a connection between disease of the tube and cholesteatoma. And many tubal swellings and tubal catarrh occur without cholesteatoma, and how many cholesteatoma without tubal disease! If we consider cholesteatoma in the petrous bone as primary, suppuration in the tympanic cavity as secondary, clinical observations can be accurately explained. The cholesteatoma grows through the most dependent portion of Shrapnell's membrane, causing inflammation in the tympanic cavity and epithelial neoplasms which are continuations of the cholesteatoma. Thus we could also understand why, notwithstanding the presence of cholesteatoma inflammatory irritations may subside and the suppuration cease temporarily. After masses have been shed spontaneously from the surface or been removed artificially by irrigation, the surface becomes temporarily dry and horny, the masses then remain dry without any apparent symptoms, and it is only when the cholesteatoma is again irritated by the invasion of some inflammatory cause, (bacteria, etc.), that new inflammation sets in, which shows itself clinically by pain, renewed secretion, etc.

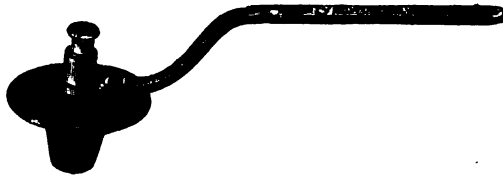
I do not believe that with this critical review the whole controversy is ended, but I wished to show that there is much left for investigation, and the important examinations of pathological anatomists cannot be gainsaid by superficial clinical observations. And this lack of clearness holds good also in regard to the so-called cholesteatoma of the external meatus and the drum-membrane, of which I shall speak at another time.

A NEW AND MORE CONVENIENT INSTRUMENT THAN THE POLITZER AIR BAG FOR INFLATING THE MIDDLE EAR.

By J. WALTER PARK, M. D.

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DEPARTMENT, HARRISBURG HOSPITAL, AND
CHILDREN'S INDUSTRIAL HOME,
HARRISBURG, PA.

FOR the past two years I have been using in my private practice an instrument for inflating the middle ear, which I claim has for convenience and practical purposes such an advantage over the Politzer air bag, that I have been induced by a number of my friends to give a description of it to the medical profession. It can only be used by those having an air-tank, as will be readily seen by the accompanying cut; nor do I claim it to take the place



of the Eustachian catheter by any means, but as an attachment to an air-tank, for the purpose of inflating the middle ear; it has quite a number of advantages the rubber air bag does not have. Its component parts are as follows: The nose-piece is made of hard rubber with a cone-shaped end to be inserted into the nostril, and on account of its conical shape it will fit any sized nostril. On the other side can be attached a metal tip to fit any automatic cut-off attachment. A curved handle about four and a half inches in length adds to its convenience and utility in fitting the nose and face nicely while in use. Its advantages are these:

1. You can inflate an ear that it is impossible to inflate with a Politzer air bag.

2. You can regulate the air pressure by putting in just as many pounds of pressure as you desire.

3. It fits any sized nose, and requires no pressure on the one side of the nostril to prevent the escape of air during the act of swallowing, or saying the word "hick," and consequently does not cause your patient any pain whatever.

4. You never have any valves leaking, or rubber cracking or breaking, and it is always ready when you want to use it.

5. It is not expensive and lasts a lifetime. Any apparatus for medicating the air can easily be attached. It is manufactured by Mr. E. B. Meyrowitz, of 104 East Twenty-Third street, New York.

82 North Second Street.

OTOLOGY.

ABSTRACTS FROM FOREIGN CURRENT OTOLOGICAL LITERATURE.

BY H. A. ALDERTON, M. D.,
OF BROOKLYN, N. Y.

UPON DEAF-DUMBNESS.

Szenes, (Budapest), investigated 124 pupils in a deaf and dumb institute. Pathological changes of the hearing organ existed in twenty-two cases ($17\frac{3}{4}\%$), but involved the middle and internal ear in only eight cases, the external ear in the fourteen remaining cases.

The degree of hearing still existing was as follows:

The watch was distinctly heard at the concha in six cases.

Politzer's acoumeter felt by bone conduction in fifty-eight cases; better in twenty-three upon the mastoid process, in fourteen in front of the tragus, and in twenty-one now here now there better.

The air conduction for the tuning forks was completely abolished in eighty-three cases, the remaining forty-one cases not always furnishing trustworthy statements.

The Galton whistle was heard by twenty-two children, five hearing it at a considerable distance—20-60 cm.

Speech was perceived in thirty cases; in eight, vowel hearing was only retained for "a;" in four, sentences could also be heard. In no case was the hearing benefitted by artificial apparatus.

Clapping of the hands was perceived in forty-three cases. In sixteen the hand-clapping was distinctly heard at a distance of eight meters, these children also hearing the Galton whistle well.

S. recommends that even in those cases that can perceive sentences, preference be given the deaf and dumb institutions over the public schools, as places of instruction. (*Sixty-sixth meeting of the German Naturalists and Physicians, at Vienna.*)

FURTHER CONTRIBUTION TO THE CURE-PROMOTING COMPLICATION OF THE ACUTE PURULENT TYMPANIC INFLAMMATION.

Szenes has observed, since a former communication, twenty similar cases, and corroborates his previous findings. The induced otitis media with the well-known symptoms takes its usual course, the severe symptoms abating with the appearance of suppuration,

and only the otorrhoea persisting. The latter becomes slightly better under treatment by antiseptics but does not cease until an otitis externa appears, that under treatment is healed in a few days, the otitis media ceasing at the same time. This occurs with such regularity that one cannot think it a matter of chance and must impute to the otitis externa a curative influence in these cases. (*Ibid*).

MALFORMATION OF THE AURICLE.

F. Rohrer, (Zuerich), describes as a unique example a merging of the crura anti-helicis with the crus helicis into a single horizontally running fold. (*Ibid*).

RUBBER PROTECTOR FOR THE POLITZER NOSE-PIECE.

Hugo Bergeat, (Munich), recommends a nose-piece consisting of a small plate in the shape of a watch-guard, to a perforation in the center of which, on its distal side, a small piece of rubber tubing is attached. The perforation, on its proximal side, fits the conical (catheter) nozzle of the Politzer bag. The use of this little mechanism makes the operation easier, does away with the danger of the operator being sprinkled with secretions, removes the danger of causing injury and bleeding of the nose, and being detachable is easily cleansed and rendered aseptic. (Monat. f. Ohrenh., October, 1894.

CLASSIFIED LIST OF THE CONTRIBUTIONS TO OTOLOGICAL LITERATURE FOR 1894.

COMPILED BY T. MELVILLE HARDIE, B. A., M. D.,
OF CHICAGO.

NOTE—All references to months, numbers, etc., in the list belong to 1894.

1. External auditory meatus.
2. Middle ear, otitis media purulenta.
3. Ossicles.
4. Mastoid.
5. Sinuses, thrombosis following middle ear disease.
6. Abscess of the brain, meningitis, etc.
7. Cholesteatoma.
8. Sclerosis.
9. Tinnitus.
10. Vertigo.
11. Facial nerve.
12. Auditory nerve, labyrinth, semi-circular canals.
13. Deaf-mutism.
14. Examination of the hearing.
15. Associated diseases.
16. Tumors.
17. Therapeutics.
18. New instruments.

I—EXTERNAL AUDITORY MEATUS.

1. Aguanno—Ann. des mal. de l'oreille, etc., August; larvæ.
2. Bacon—Rev. de Laryng., No. 9.
3. Barclay—Med. and Surg. Rep., February 3; fracture.
4. Bezold—Trans. Germ. Otol. Soc.
5. Courtade—Jour. Laryng. Mar.; rupture from muscular effort, persistent hemorrhage.
Union Med., No. 24; Soc. de Therapeutique, February 4.
Treatment of abscess by intubation.
6. Dabney—Med. and Chirurg. Rep., January 20.
7. Haug—Archiv. f. Ohrenheilk, XXXVI, 3; neoplasms.
8. Hermet—Bull. et mem. de la Soc. de Lar., May; eczema:

9. Jansen—Trans. Third reunion Germ. Otol. Soc.; plastic operations in stenosis.
10. Koerner—Ibid; ditto.
11. Kuhn—Ibid; atresia.
12. Ostmann—Monats. f. Ohrenheilk, August, September; production of exostoses.
13. Randall—Trans. Amer. Otol. Soc., VI; anatom. studies.
14. Raoult—Rev. med. de l'Est., February; fly-larvæ.
15. Ray—Amer. Pract. and News, February 27; occlusion.

II—MIDDLE EAR, OTITIS MEDIA PURULENTA.

1. Bacon—N. Y. Eye and Ear Infirm. Rep., January.
2. Caldwell—N. Y. Med. Jour., September 8.
3. Dahlgren—Univ. Med. Jour., October.
4. Dodd—Chicago Med. Recorder, February; conjugate deviation of eyes.
5. Eitelberg—Wiener Klinik, July, August.
6. af Forselles—Archiv. f. Ohrenheilk, XXXVI, 3.
7. Hartmann—Trans. third reunion Germ. Otol. Soc.
8. Hoffmann—Archiv. f. Ohrenheilk, XXXVI, XXXVII; Section of tensor tympani.
9. Kossel—Charite-Annalen, eighteenth year; in infants.
10. Ledermann—Med. Record, April 14.
11. Marsh—Birmingham Med. Review, February.
12. Stern—Zeitschr. f. Ohrenheilk, XXVI, 1; bacteriology.
13. Szenes—Archiv. f. Ohrenheilk, XXXVII, 3, 4; euphen, etc.

Jour. of Laryng.

Annals of Ophth. and Otol., III.

14. Tillaux—Semaine Méd., September 19.
15. Wilson—Trans. Amer. Otol. Soc., VI.

III—OSSICLES.

1. Adams—Trans. Amer. Otol. Soc., VI.
2. Barr—Jour. of Laryng., October; excision of malleus.
3. Barth—Trans. Germ. Otol. Soc.
4. Bezold—Annals of Ophth. and Otol., III, 3.
Zeitschr. f. Ohrenheilk, XXVI, 1; ankylosis of stapes.
5. Blake—Annals of Ophth. and Otol., III, 331.
6. Dench—Med. Record, June 9.
Annals of Ophth. and Otol., III, 337.
Trans. Amer. Otol. Soc., VI; on value of operations.
7. Garnault—Annals of Ophth. and Otol., III, 331.

8. Gellé—Bull. et mem. de la Soc. de Laryng. No. 1; stapes.
9. Gomperz—Annals of Ophth. and Otol., III, 112.
10. Jack—Trans. Amer. Otol. Soc., VI; stapedectomy.
11. Kessel—Trans. third reunion Germ. Otol. Soc.; mobilization and extraction of stapes.
12. Ludewig—Jour. Laryng., June.
Annals of Ophth. and Otol., III, 329.
13. Milligan—Revue de Laryng., No. 1.
Jour. of Laryng., October; excision of ossicles.
14. Miot—Semaine Méd., No. 28; mobilization.
15. Randall—Therapeut. Gazette, February.
16. Rohrer—Wien. Med. Wochenschr., No. 1.
17. Stratten—Inaug. thesis Halle.

IV—MASTOID.

1. Allen—Archives of Otol., January, April; Stacke.
2. Blake—Jour. Laryng.
3. Broca—Bull. Méd., October 24; eighty-seven operations.
4. Bronner—Rev. de Laryng., No. 2.
5. Clarke—Lancet, July 14.
6. Cozzolino—Jour. Laryng., June.
7. Eulenstein—Monatschr. f. Ohrenheilk, March; percussion of mastoid.
8. af Forselles—Archiv. f. Ohrenheilk, XXXVI, March; modification of Stacke operation.
9. Gomez—N. Y. Med. Jour., September 1.
10. Grünert—Annals of Ophth. and Otol., III, 109.
11. Knapp—Archives of Otol., January, April; tuberculosis of mastoid.
12. Koerner and Wild—Archives of Otol., January, April; percussion of mastoid.
13. Lange—Archiv. f. Klin. Chirurg., XLVII, 1.
14. Lubet-Barbon—Soc. Franç. d'Otol., May.
Annals of Ophth. and Otol., III, 332.
15. Luc—Archiv. Internat. de Laryng., No. 3.
16. Macewen—Rev. de Laryng., No. 2.
17. Maurel—Ibid, No. 2.
18. Moos—Archives of Otol., January, April; diagnosis.
19. Robertson—Rev. de Laryng., No. 1.
20. Rosenberg—Deut. Med. Wochenschr., No. 28; prophylactic removal of mastoid.
21. Schleicher—Rev. de Laryng., September 1; Stacke.

22. Schmiegelow—Archives of Otol., January, April.
 23. Vulpus—Med. Record, June 16.
Annals of Ophth. and Otol., III, 337.
 24. Walsham—St. Barthol. Hosp. Rep., XXIX.
 25. Weissmann—Cong. de la Soc. Franç. de Laryng., May 1.
 26. Zaufal—Archiv. f. Ohrenheilk, XXXVII, 1 and 2.
Prag. Med. Wochenschr., No. 27; actinomycosis.
- V—SINUSES. THROMBOSIS FOLLOWING MIDDLE EAR DISEASE.
1. Blake—Trans. Amer. Otol. Soc., VI.
 2. Buck—Med. Record, June 30.
Trans. Amer. Otol. Soc., VI.
Annals of Ophth. and Otol., III, 338.
 3. Crockett—Trans. Amer. Otol. Soc., VI.
 4. Grünert—Archiv. f. Ohrenheilk, XXXVI, 1 and 2.
 5. Jansen—Archiv. f. Ohrenheilk, XXXVI, 1 and 2.
Annals of Ophth. and Otol., III, 206; 40 cases.
 6. Moos—Zeitschr. f. Ohrenheilk, XXV, 3, 4.
 7. Reinhardt—Trans. third reunion Germ. Otol. Soc.
VI—ABSCESS OF THE BRAIN, MENINGITIS, ETC.
 1. Annandale and McBride—Brit. Med. Jour., February 17.
Edin. Med. Jour., April.
 2. Barker—Clin. Jour., February 28; suppuration in lateral sulcus.
 3. Broca—Bull. Méd., No. 24.
 4. Burnett—Annals of Ophth. and Otol., III, 152.
 5. Guye—Trans. Germ. Otol. Soc.
Zeitschr. f. Ohrenheilk. XXVI; pachymeningitis ext.
 6. Hansberg—Trans. third reunion Germ. Otol. Soc.
Rev. de Laryng., August 1.
 7. Jansen—Trans. third reunion Germ. Otol. Soc.
 8. Knapp—Archiv. of Otol., No. 3.
Zeitschr. f. Ohrenheilk, XXVI, 1.
 9. Koerner—Trans. third reunion Germ. Otol. Soc.
Zeitschr. f. Ohrenheilk, XXVI, 1.
 10. Moos—Archives of Otol., No. 3.
Zeitschr. f. Ohrenheilk, XXV, 3, 4.
 11. Moure—Archiv. Ital. di Otol., July.
 12. Tuffier and Tucker—Bull. de la Soc. Anat. de Paris, March.
- VII—CHOLESTEATOMA.
1. Baginsky—Berl. klin. Wochenschr., Nos. 26, 27.
 2. Gleason—Med. Bulletin, March.

3. Lichtwitz and Sabrezés—*Bull. Med.*, No. 25.
4. Panse—*Archiv. f. Ohrenheilk*, XXXVI, 4.
5. Reinhardt—*Archiv. f. Ohrenheilk*, XXXVII, 1, 2.
Annals of Ophth. and Otol., III, 327; treatment by persistent retro-auricular opening.
6. Scheibe—*Zeitschr. f. Ohrenheilk*, XXVI, 1.

VIII—SCLEROSIS.

1. Blake—*Annals of Ophth. and Otol.*, III, 330; exploratory tympanotomy treatment.
2. Bosio—*Internat. Cong.*, Rome.
3. Broeckeaert—*Presse Méd. belge*, June 23.
4. Eeman—*Rev. de Laryng.*, September 1.

IX—TINNITUS.

1. Blake—*Annals of Ophth. and Otol.*, III, 331.
2. Gellé—*Presse Méd.*, March 3.
Tribune Méd., No. 35.
3. Hanel—*Inaug. thesis*, Jena; influence of tinnitus on production of hallucinations.
4. Kaufman—*Monatschr. f. Ohrenheilk*, No. 5.
5. Madeuf—*Jour. of Laryng.*, July; auscultation of noises in ear.
6. Mermod—*Rev. internat. de Rhinol.*, etc., No. 6.
7. Peaucellier—*Gaz. Méd. de Picardie*, No. 5.
8. Seiss—*Annals of Ophth. and Otol.*, III, 64; treatment, chloride of ethyl.

X—VERTIGO.

1. Avoledo—*Internat. Med. Cong.*, Rome.
2. Burnett—*Trans. Amer. Otol. Soc.*, VI.
Med. Age, June 11.
Annals of Ophth. and Otol., III, 336; treatment by removal of incus.
3. Dalby—*Brit. Med. Jour.*, May 12.
4. Labit—*Soc. Franç. d'Otol.*, etc., April 30.
5. Mackenzie—*Brit. Med. Jour.*, May 5.

XI—FACIAL NERVE.

1. Briese—*Inaug. thesis*, Halle.
2. Gellé—*Ann. des mal. de l'oreille*, No. 1.
Jour. of Laryng.
3. Hammond—*Med. News*, May 26.
Annals of Ophth. and Otol., III, 338; paralysis following operation.

4. Lannois—Gaz. Méd. de Paris, No. 35.

5. Wittstock—Inaug. thesis, Gottingen.

XII—AUDITORY NERVE, LABYRINTH, SEMI-CIRCULAR CANALS.

1. Cannieu—Thesis, Bordeaux; Rev. de Laryng., No. 8.

Ann. des mal. de l'oreille, No. 7.

2. Daae—Archives of Otol., 4; on double hearing.

3. Gradenigo—Archives of Otol., 4; on monaural diplacusis.

4. Herhold—Deut. Med. Wochenschr., No. 14; necrosis of bony labyrinth.

5. Lannois—Semaine Méd., No. 28; on monaural diplacusis.

6. Matte—Fortschritte d. medicin, No. 4.

7. Moos—Internat. Cong., Rome; Jour. of Laryng.; function of semi-circular canals.

8. Politzer—Zeitschr. f. Ohrenheilk, XXV, 3, 4.

Deut. med. Zeitung, No. 49.

Archives of Otol., No. 4; primary disease of bony capsule of labyrinth.

9. Prompt—Dauphiné Méd., No. 1.

10. Siebenmann—Zeitschr. f. Ohrenheilk, XXVI, 1; blood vessels of labyrinth.

11. Stein—Study of function of the several parts of labyrinth, Fischer, Jena.

XIII—DEAF-MUTISM.

1. Benedikt—Berl. klin. Wochenschr., No. 31.

2. Chappet—Lyon Méd., No. 12.

3. Coyne—Archiv. clin. de Bordeaux, No. 4.

4. Delore—Lyon Méd., No. 15.

5. Fink—Vienna; exercises in Deaf and Dumb Institute of Vienna.

6. Giampietro—Ann. des mal. de l'oreille, No. 3.

7. Mygind—Zeitschr. f. Ohrenheilk, XXVI, 1; deaf-mutism, Leipzig, London.

8. Rossi—Boll. delle malatt. dell'orecchio, August: anthropology.

9. Urbantschitsch—Wien. klin. Wochenschr., Nos. 1, 19.

Annals of Ophth. and Otol., III, 333.

XIV—EXAMINATION OF THE HEARING.

1. Alderton—Archives of Otol. No. 3.

2. Berzold—Ibid.

3. Gellé—Tribune Méd., No. 11.

4. Richter—Archiv. f. Ohrenheilk, XXXVI, 3.

5. Zwaardemaker—Zeitschr. f. Ohrenheilk, XXV, 3, 4.

XV—ASSOCIATED DISEASES.

- (a) *Dentition.*
 Turnbull—Med. and Surg. Rep., March 31.
 Annals of Ophth. and Otol., III, 210.
 Relation of dentition and diseases of the teeth to diseases of the ear.
- (b) *Hysterical deafness.*
 Cartaz—Semaine Méd., No. 28.
 Gradenigo—Archiv. Ital. di Laryng., etc., II, 4.
 Ingals—Jour. of Laryng.
 Woods—New Orleans Med. and Surg. Jour., September.
 Hysterical deafness treated by hypnotism.
- (c) *Oto-neurasthenia.*
 Cozzolino—Jour. of Laryng., June.
- (d) *Influenza.*
 Butler—Canad. Pract., March.
 Charlier—Rev. internat. de Rhin., etc., No. 9.
 Lemeck—Rev. de Laryng., August 1.
- (e) *Syphilis.*
 Delie—Annals of Ophth. and Otol., III, 209.
 Delsaux—Rev. internat. de Rhin., No. 6.
 Jour. of Laryng., January.
 Gradenigo—Archiv. Ital. di Laryng., etc., II, 4.
 Jour. of Laryng, May.
 Sclerosis in hereditary syphilis.
 Passigli—Boll. delle mal. dell'orecchio, No. 3.
 Poli—Internat. Cong., Rome: Jour. of Laryng.
- (f) *Tuberculosis.*
 Knapp—Archiv. of Otol., January, April; tuberculosis of mastoid.
- (g) *Auricular Reflexes.*
 Bonnier—Bull. et mem. de la Soc. de Laryng. de Paris, February.

XVI—TUMORS.

1. Cozzolino—Archiv. Ital. di Otol., etc., July; fibroma.
2. Denker—Trans. Germ. Otol. Soc.
 Zeitschr. f. Ohrenheilk, XXVI; carcinoma of meatus, etc.
3. Ferreri—Archiv. Ital. di Otol., No. 2; epithelioma,
4. Kuhn—Trans. third reunion Germ. Otol. Soc.; myxo-sarcoma.

XVII—THERAPEUTICS.

1. Avelis—All. Wien. med. Zeit., September 18, 25; errors of general practitioners in treatment of affections of the ear and nose.
2. Cheatham—Amer. Pract. and News, February; quinin.
3. Jirmounski—Wratch. No. 3, Med. Record, March 31.
Annals of Ophth. and Otol., III, 212; pilocarpin.
4. Metcalfe—Rev. de Laryng., No. 2; pilocarpin.
5. Plicque—Ann. des mal. de l'oreille, September; electricity in otology.

XVIII—INSTRUMENTS.

1. Alderton—Rev. de Laryng., No. 9; irrigation tube.
2. Delstanche—Rev. de Laryng., No. ; incus extractor.
3. Dench—improved Galton whistle.
4. Eschbaum—Monats. f. Aerzte Polik., No. 1; new dilators.
5. Dundas Grant—Jour. of Laryng.; magnifying ear speculum; furuncle knife.
6. Lautenbach—Med. News, January 27; double-headed ear screw for foreign bodies.
7. Lewy—Internat. Cong. Rome, Jour. of Laryng.; new acoumeter.
8. Lucae—Berl. klin. Wochenschr., April 16.
9. Todd—N. Y. Med. Jour., May 5; middle ear syringe.

THYROTOMY FOR REMOVAL OF MULTIPLE PAPILLOMA OF THE LARYNX,

BY WENDELL C. PHILLIPS, M. D.,
OF NEW YORK.

ASSISTANT SURGEON TO THE MANHATTAN EYE AND EAR HOSPITAL THROAT
DEPARTMENT; INSTRUCTOR IN DISEASES OF THE NOSE AND
THROAT IN NEW YORK POST-GRADUATE MEDICAL
COLLEGE AND HOSPITAL.

V N., colored, 11 years of age, came to the throat department of the Manhattan Eye and Ear Hospital June 30, 1893, and gave the following history:

Born in Tennessee; father dead, cause of death unknown; child was in good health until 3 years of age, when mother left her in the South and did not see her for seven years, November, 1892, when she learned that the child had lost her voice; child says voice had been lost for several years. The child had been neglected, had lived a wild out-of-door life, with scarcely any clothing and no shoes and stockings, constantly exposed to the elements.

Diagnosis. Papillomatous growths were found occupying the region of right false cord, extending around to and partly covering left cord. Temp. 100°, pulse 86, but patient is strong and vigorous.

She was admitted to the hospital and given potassium iodid 10 grs. three times a day and local applications. This treatment was continued for three weeks with no improvement. July 29, I removed two or three small pieces with Schrötter's tube forceps and the pathologist's report confirmed the diagnosis.

August 2. Removed two small sections.

November 22. During this interval several pieces were curetted out, with some relief. It was noted that after forceps were introduced she had for several minutes great difficulty of respiration. On two occasions I feared tracheotomy might be necessary. Her tonsils were hypertrophied and were removed to give more room for examination. This plan of treatment was followed, occasionally removing portions until March, and with no permanent improvement. Respiration was comparatively easy except when running or climbing stairs. At this time her condition began to be more serious, and an operation—thyrotomy—was advised and

consented to. Accordingly, on March 30, 1894, she was admitted to the Manhattan Eye and Ear Hospital, and on May 4 a preliminary low tracheotomy was performed under an anesthetic. Alcohol and chloroform being used before ether to prevent struggling and possible asphyxia. She was placed in a room the temperature of which was kept at 75° . There was but little reaction and she slept well all night. Her temperature for the first week did not reach 100° . She was kept on special diet—milk, soups, etc.—and she did not cough except when tube was cleansed. As is usual, the growths reduced considerably in size as a result of the tracheotomy. On April 20, sixteen days after the tracheotomy, I performed the operation of thyrotomy, ether being administered through a rubber funnel attached to a long piece of tubing which was inserted into the tracheotomy canula. The shoulders were elevated, leaving the head hanging well down. A long incision was made down to and exposing the entire thyroid cartilage, crico-thyroid membrane and the cricoid cartilage. With a probe-pointed curved scissors the probe blade was plunged through the crico-thyroid membrane and the entire body of the thyroid cartilage divided through to the notch. The hemorrhage was considerable for a moment, but entirely subsided. Small French sponges were passed downwards into the trachea and no trouble was experienced from blood passing downwards.

When the segments of the thyroid were held apart by retractors, the masses of papillomata protruded from the wound. They were very numerous and were found to be attached not only to the vocal cords, but to the entire subglottic region, and also to the ventricles.

The growths were removed mostly with a curette, a few being removed by the cutting forceps and scissors.

The whole surface was thoroughly curetted and thoroughly cauterized with the galvano-cautery. After hemorrhage had been controlled the cartilage was closed by four stitches of the largest catgut, and the external wound entirely closed with silk.

It is scarcely necessary to say that the operation was performed under strict antiseptic precautions.

She was again placed in a room with constant temperature at 75° . Diet special, milk and bran water. She was very restless all night and slept but little; no pain.

At 9 p. m. the temperature began to rise and by 3 o'clock a. m. of the 21st it had reached $105\frac{6}{8}^{\circ}$ and pulse 136, resp. 32. Phenacetin and cafferin were given and by 6 a. m. temperature was 103° . (Accompanying charts give temperature range).

For the next four days temperature ranged from $104\frac{1}{2}^{\circ}$ gradually down to normal. Pulse was exceedingly weak and irregular, and $1\frac{1}{8}$ grs. strychnine was administered hypodermatically every three hours. On the 22d she complained for the only time during the treatment of slight pain in the throat. On this day the pulse reached 140° . The inner tube was cleansed when necessary. The discharge through the tracheotomy tube increased for a few days after operation, but at no time has she had any symptoms of any extension to the bronchial tubes or lungs; she took nourishment well and could breathe freely by mouth even when tube was closed.

On the 24th the dressing was changed and found to be healed in the upper part, but two or three of the lower stitches were separated; cleansed and packed with iodoform gauze.

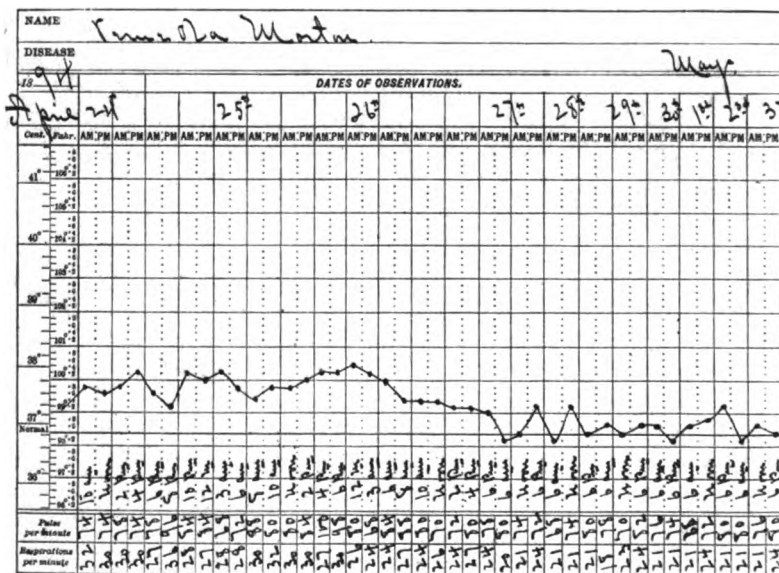
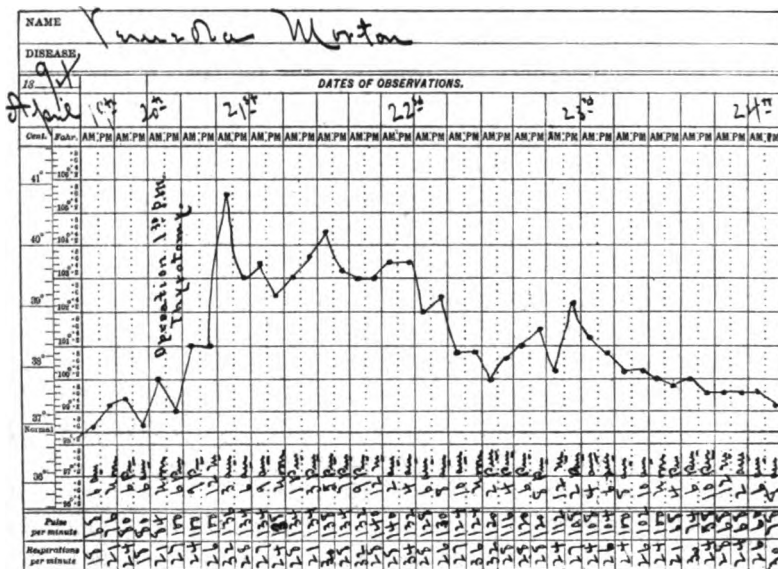
The lower part of the wound has gradually healed by granulations, and but a small sinus now remains.

Her voice, entirely lost before operation, has improved slightly. No hope of return of phonation was given previous to operation, and the vocal cords were found to be badly damaged by the long continued pressure of the papillomata.

Examination with mirror May 21st, one month after operation: Entire larynx is still somewhat congested but appears to be clear, and no sign of recurrence or of stenosis from adhesions.

It is interesting to note that previous to operation the case was diagnosed as multiple papilloma of the vocal cords while the operation proved it to cover so large a surface, and that no endolaryngeal procedure would have been successful in her case.

July 15th. Examination to-day reveals no recurrence. Phonation is much improved, but no natural tone can be produced, it being forced and hoarse.




THE NASAL TREPHINE IN HYPERTROPHY OF THE INFERIOR TURBINATED BODY.

BY G. MELVILLE BLACK, M. D.,
OF DENVER, COLO.

PROFESSOR OF RHINOLOGY AND LARYNGOLOGY IN THE COLORADO SCHOOL
OF MEDICINE; EX-HOUSE SURGEON MANHATTAN EYE
AND EAR HOSPITAL, NEW YORK.

IN advocating this method of treatment, it is not my intention to condemn other well known and well tried procedures, such as the galvano-cautery, the snare, and chemical caustics. Each have their places in the treatment of hypertrophic rhinitis. In any surgical procedure in the nose the object in view should be to remedy the defect with as little damage to the part as possible, whereby its function may be preserved. It is my desire to bring to your attention in the use of the Nasal Trephine an instrument which, in skillful hands, brings about more reduction in the size of the turbinated body, with less damage to the part, than any other operation I know of.

The Nasal Trephine as sold by most instrument makers is from $\frac{3}{4}$ to $1\frac{1}{4}$ inches in length, is attached to a steel stem which fits into a dental hand-piece and is run by a dental engine or an electro-motor. If the turbinated body is universally hypertrophied, the trephine is placed against the anterior and inferior portion of it, as indicated by the dotted lines in the drawing, and a semicircular or circular piece of tissue removed from the entire length of the body. If the hypertrophy is confined to a portion of the turbinated body only, the trephining is limited to that portion.



I have found that the trephines spoken of above were so short, that before one-half of the hypertrophied surface was trephined through, the trephine would be plugged full of hypertrophied tissue, necessitating the withdrawal of the instrument and removal of the tissue therein. This was found to be very inconvenient, inasmuch as the hemorrhage, which followed the withdrawal of the instrument, so disguised the part as to render it difficult to reintroduce the trephine in the same place. I therefore had Mr.

E. B. Meyrowitz, of New York, make for me a set of trephines $2\frac{1}{2}$ inches long. This drawing shows the largest instrument in its actual size :

The three rings in accompanying drawing indicate the size of their calibers. With this instrument the objection which I found to the usual trephines in use is overcome, it being sufficiently long to trephine from one end of the turbinated body to the other without its becoming plugged with tissue. The advantages of the operation over the cautery and acids are :

1. The clean cut surfaces of the semicircular opening made at the inferior portion of the turbinated body, fall together and heal by first intention, thereby at once restoring free nasal respiration.
2. There is no secretion to speak of after the first twenty-four hours.
3. There is no perceptible cicatrix. The surface of the turbinated body is of normal shape.
4. It is extremely rare that more than one operation is required.
5. There is no danger of adhesion of the turbinated body to the septum.

The only objection that I can see to this operation is that hemorrhage is quite free for a few moments, and that some oozing continues for several hours; however, I have never found the hemorrhage alarming or even annoying.

I have used the trephine in hypertrophy of the inferior turbinated body for the past three years with universal success. I began its use in cases of true hypertrophy only where it was especially indicated, but of late have been gratified to find that it has proved of great value in cases of engorgement which were not benefited by the usual cleansing and astringent applications. Some of these cases of engorgement are very hard to manage. Even the galvano-cautery fails to produce anything more than transient benefit. It is disagreeable to find it necessary to cauterize every few months, as eventually we have almost a functionless turbinated body from such extensive destruction of tissue. With the smallest size trephine, the turbinated body is penetrated from end to end just beneath the mucous membrane, thereby a portion of the vascular plexus is destroyed. The immediate result being more or less swelling of



the turbinated body from extravasation of blood, which lasts about four or five days when the body begins rapidly to reduce in size, until at the end of two weeks from the time of the operation it is of normal size and appearance. In a few instances it has been necessary to repeat the procedure, but as a rule one operation is sufficient. In these cases of engorgement it is well to operate upon one side at a time, not proceeding with the other until the swelling has subsided.

I cannot recommend the operation for hypertrophy of the middle turbinated body. inasmuch as, owing to the position of this body, it is next to impossible, in the majority of instances, to do anything more than trephine directly into the body from below, upwards. The snare and cautery are much more efficacious in this region.

PROFESSIONAL NEWS.

Dr. Henry A. Alderton, of Brooklyn, N. Y., whose ability is excelled only by his energy, and will to work, has consented to assist in gleaning from the current otological literature of the world all that is practical and useful for the readers of the ANNALS.

Dr. G. W. Grove, formerly assistant surgeon in the Eye Department of the New York Nose and Throat Hospital, and the O. D. P. Bellevue Medical College Hospital, has removed from New York to Kansas City, Mo.

Dr. W. H. Wakefield has removed from Winston, N. C., to Charlotte, N. C.

The Kansas City, (Mo.) Academy of Medicine spread its Fifth Annual Banquet at the Midland Hotel on Tuesday evening, January 8th. The Academy is doing the best work of any society west of Philadelphia, and has in its library the largest collection of recent "up to-date" medical books west of New York.

Dr. T. Melville Hardie, of our editorial staff, was quietly married on the evening of December 17th, to the only daughter of Judge Gwynn Garnett, of Chicago. After their wedding tour Dr. and Mrs. Hardie will reside at 3604 Grand Boulevard. The ANNALS wishes them all happiness in the coming years.

FOR SALE.

THE PRACTICE OF AN OCULIST AND AURIST.

This practice has been in existence eleven years, and produces about \$14,000 in cash. Splendid central location, fine offices, long lease, name and address of patients for eleven years to whom notices may be sent; will thoroughly introduce purchaser; college, hospital and railroad appointments a possibility to the right man; best reasons for selling; beautiful city of 200,000 inhabitants. This is one of the rarest opportunities and will be sold for \$7,000 cash. Do not apply unless you mean business. Address B, care Dr. Jas. P. Parker, Union Trust Building, 701 Olive Street, Saint Louis, Mo.

BOOK NOTICES.

A PRACTICAL SYSTEM OF SELF-INSTRUCTION IN THE GERMAN LANGUAGE FOR PHYSICIANS AND MEDICAL STUDENTS. BY ALBERT PICK, M. D. PUBLISHED AND FOR SALE BY EDWARD S. TANNER, NEWTONVILLE, MASS., IN TWELVE PARTS AT FIFTY CENTS PER PART OR SIX DOLLARS FOR THE COMPLETE WORK.

As the title of this work implies it is intended for self-instruction and will enable physicians to learn to read German medical literature and converse with German patients in their tongue. The instruction is imparted by means of a series of short essays on medical subjects in German with interlinear translation and pronunciation. Each lesson is supplemented by a number of elementary phrases used in conversation, and by some brief but sufficient remarks on grammar. It is well adapted for the purpose of imparting a knowledge of medical German and will surely "fill a long felt want" if the hungry doctor, for medical science, will study it carefully and learn to curry favor with wealthy German patients.

A BOOK FOR TRIAL-LENSES. Of all the books that I have been called upon to review this is the most original. When closed it has the appearance of a substantially bound volume about the size of Gould's excellent New Illustrated Dictionary of Medicine. It opens at the middle and presents to view, in racks, a complete set of Nacet's trial-lenses, trial-frames, etc.

The only two leaves in the book are of heavy board and are intended to hold the lenses in place while it is closed, and these leaves have Snellen's test-letters on them and can be removed from the book and hung on the wall, or elsewhere, and used for testing patient's vision. The book (case for trial-lenses) fits a "dictionary holder" which allows it to be raised or lowered to any height and "fixed" on an incline of any desired angle.

The portability and convenience of this simple ingenious case and holder for test-lenses commends it to those who work at refraction four to six hours each day, as it holds the lenses so near and convenient that stooping and fatigue are avoided. The author (inventor) of the book has no "copyright" and he desires no advertising as he is a busy blank-book manufacturer who has all

the business he wants. The idea came to him while watching me test his little daughter's eyes, and he had the book (case) made and presented it to me. Any ophthalmologist can have a good book-binder dissect an old worn-out Nachet case and get the leather strips bearing the numbers of the lenses and the racks, and have the book made at small expense, and the "dictionary holder" can be obtained at any stationery store. J. P. P.

ONE HUNDRED YEARS OF BUSINESS LIFE. BY MESSRS. W. H. SCHIEFFELIN & CO., OF NEW YORK CITY. A GREETING TO THEIR FRIENDS, IN THE FORM OF A PAMPHLET SETTING FORTH THE HISTORICAL AS WELL AS COMMERCIAL SIGNIFICANCE OF THE COMPLETION OF A CENTURY OF EXISTANCE OF THE HOUSE OF W. H. SCHIEFFELIN & CO.

The fine "hand-made" Holland paper, handsome engravings, and elegant printing of this beautiful pamphlet cannot fail to excite admiration. It is absolutely the most beautiful pamphlet ever produced in America, or any other country.

It is in keeping with the high grade of drugs and pharmaceutical preparations that are supplied by W. H. Schieffelin & Co., who *do all they undertake well*. The writer was brought up by one of the most thorough, careful, and conscientious pharmacists who ever conducted a pharmacy, and every pound of opium and cinchona bark that entered the establishment had to be assayed before it was placed "in stock," and it was the writer's business, for seventeen years, to make the assays and estimate the value of the drugs, and during all of those years no error was detected in the assay of a package, bearing the assay on the label, of Schieffelin & Co., though it would have been a great pleasure to have detected an error, as there was a standing prize for the detection of an error in an assay of their laboratory.

[As one who was brought up under the old regime, I cannot refrain from saying in this connection that the modern craze of physicians to be their own pharmacists and dispense tablets and preparations that they are unable to determine the contents of, will do scientific therapeutics more harm than homeopathy. It appears that physicians who feel "called" to fight scientific pharmacy do not see that the more intelligent and best trained pharmacists will soon be compelled to qualify as physicians, because a pharmacist cannot live without the support of physicians, and no well trained pharmacist will submit to being placed on a level with a common merchant. Pharmacists make the best physicians and surgeons, and

it requires but little effort for a well trained pharmacist to make a doctor, and he will enter the medical college with a full knowledge of materia medica, therapeutics, chemistry and pharmacology, so that "medicine" will come easy to him. His hands have been trained to handle small packages, small weights and *very small* amounts of money, which develops good use of his hands and enables him to excel other men in operative surgery.]

To return to the pamphlet of W. H. Schieffelin & Co., we find it divided into six chapters, giving six changes in the composition and name of the firm and periods of development of American commerce. The story is well presented and is very interesting. The pamphlet contains fifty-six pages, with an appendix, giving a complete history of "One Hundred Years of Chemistry and Pharmacy," all of which must be read to be appreciated.

J. P. P.

MISCELLANEOUS.

ALVARENGA PRIZE OF THE COLLEGE OF PHYSICIANS OF
PHILADELPHIA.

The College of Physicians of Philadelphia announces that the next award of the Alverenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about \$180. will be made on July 14, 1895, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

Essays intended for competition may be upon any subject in medicine, but cannot have been published, and must be received by the secretary of the college on or before May 1, 1895.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within it the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in possession of the college; other essays will be returned upon application within three months after the award.

The Alvarenga prize for 1894 was awarded to Dr. G. E. de Schweinitz, of Philadelphia, for his essay on Toxic Amblyopias.

Essays, in competition for the next award, should be sent to the secretary of the college, Dr. C. W. Dulles.

HYDROGEN DIOXIDE. H_2O_2 .

By Dr. L. D. KASTENBINE, A. M., M. D., Professor of Chemistry, Urinology, and Medical Jurisprudence, Louisville Medical College, Professor of Chemistry Louisville College of Pharmacy. This remarkable liquid which contains the greatest percentage of oxygen of any compound known, was for sometime considered as a mere solution of oxygen in water, and consequently was called oxygenated water. It was afterward obtained free from water and found to be a definite chemical compound of hydrogen and oxygen, and differing from water in containing twice as much oxygen. It has a somewhat bitter, astringent taste, and is color-

less, transparent and without odor. It contains 94 per cent of oxygen gas by weight, and will yield 475 times its volume of that gas.

A fifteen volume solution is one that will give off fifteen volumes of gas from one volume of the solution. A ten volume solution will yield ten pints of oxygen gas from one pint of the solution, and so on.

These solutions, although more stable than mere concentrated preparations, nevertheless decompose and lose their nascent oxygen on which its powerful antiseptic powers depend, and consequently we find the commercial brands varying considerably from their reputed strengths. Of the various brands of commercial dioxides I have examined, I find Marchand's to be the one which yields the largest amount of available oxygen under all conditions of exposure, and the one which contains the minimum percentage of free acid. All the marketable articles I have seen are free from barium compounds, but the majority do not come up to the 15 volume standard, but are 6, 8, 10 and 12 volume solutions.

NOTICE.

A CALENDAR for 1895 upon receipt of request. P. Blakiston, Son & Co., Medical Booksellers, 1012 Walnut street, Philadelphia, will send free by mail, postage prepaid, a neat desk calendar for 1895.

VOLUME IV.

JANUARY, 1895.

No. 1.

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ON THE ALLEGED ACTION OF THE OBLIQUE
MUSCLES IN OBLIQUE ASTIGMATISM.¹

By F. C. HORTZ, M.D.,
OF CHICAGO.

DURING the past seven years Dr. Savage has talked and written a great deal on the action of the oblique muscles in oblique astigmatism,² trying to convince us "that a revolution of the eyes on their antero-posterior axes, for the improvement of vision, occurs in all cases of oblique astigmatism." Unfortunately, however, his papers furnish no evidence for the actuality of this rotation, beyond the mere statement that he has often observed it.

But in this skeptical age such unsupported assertions are not sufficient to establish a scientific fact. We want to know by what methods of observation, by what tests or experiments a writer has been led to his conclusions, so that we may test his methods in suitable cases and judge for ourselves whether his observations are correct and his conclusions well founded.

¹Read before the Chicago Society of Ophthalmology and Otology, January 15, 1895.

²The term "oblique astigmatism" is an acceptable abbreviation for designating astigmatism in which the principal meridians do not coincide with the vertical and horizontal meridians of the cornea.

That Dr. Savage has deemed it unnecessary to furnish us the data by which we could verify his observations is to be regretted, the more so because the theories by which at different times he has endeavored to explain the necessity of this action of the oblique muscles in oblique astigmatism, leave us very much in doubt as to whether and what kind of rotations Dr. Savage has really seen at different times. In 1887 he explained the rotation by the "harmonious, non-symmetrical action of the oblique muscles." The superior oblique of the one eye and the inferior oblique of the other were supposed to act in association to "so rotate the eye on its antero-posterior axis as to bring its best meridian vertical or horizontal."³ But in 1891 he speaks of the "harmonious symmetric action of the oblique muscles;"⁴ the alleged rotations are supposed to be brought about by the associated action of both superior obliques or both inferior obliques.

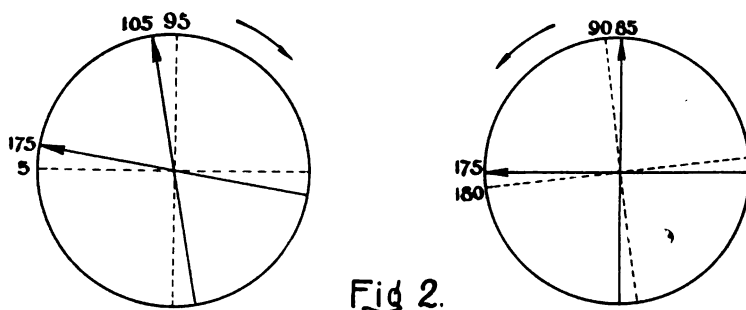
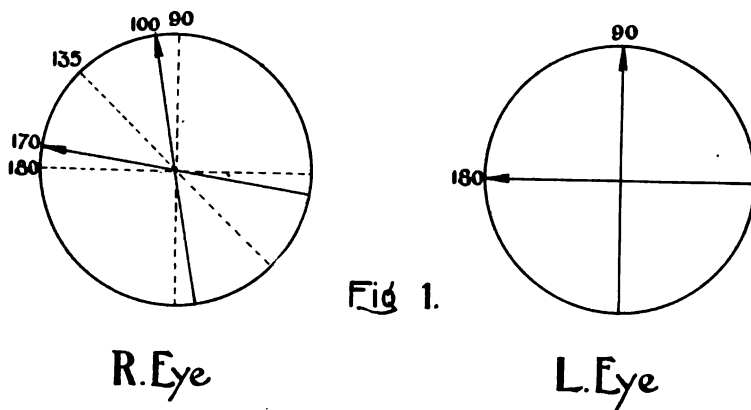
Now, if both superior obliques act together the upper ends of the vertical meridians of both eyes are rotated toward each other, and by the simultaneous action of both inferior obliques they are turned away from each other, while by the associated action of the superior oblique of one eye and the inferior oblique of the other, both vertical meridians are turned in the same direction (either both to the right or both to the left). It is therefore evident that according to Dr. Savage oblique astigmatism in 1887 made the eyeballs rotate in the *same* direction, but in 1891 in *opposite* directions; but why should the same physical cause (oblique astigmatism) produce such opposite effects at different times? It does not seem possible that Dr. Savage has actually seen these different rotations and it seems more probable that they have been suggested to him by the different views he entertained in 1887 and 1891 in regard to what was to be attained by the revolving of the eyeballs. In 1887 Dr. Savage was of the opinion that astigmatism "is least troublesome to a patient if the best meridian is vertical, as in hypermetropic astigmatism, or horizontal, as in myopic astigmatism," and that it is the function of the oblique muscles to so rotate the eye on its antero-posterior

³ The functions of the oblique muscles in certain cases of oblique astigmatism. *Journal of the American Med. Association*, Nov. 5, 1887.

⁴ *New Truths in Ophthalmology*, Chapter 2.

diameter as to bring its best meridian to the vertical or to the horizontal," and this he said is accomplished by the non-symmetrical action of the oblique muscles.⁵

But in 1891 he had conceived the idea that the oblique muscles had to rotate the eyes so as to bring the images of a horizontal object upon corresponding retinal meridians, and this change of opinion made necessary a change in the revolution of the eyeballs and suggested the symmetric action of the oblique muscles.



Has this second theory of Dr. Savage any better foundation than his first one? His explanation is as follows:

"In oblique astigmatism, be the obliquity much or little, it is a physical impossibility for the horizontal object and its

⁵ Dr. Savage admitted later that "at that time the condition necessitating this revolving of the eyes was not clear to me;" and I am sure that every one who has read that paper fully agrees with him on this point.

retinal image to occupy the same plane. The same is true of all objects not in a plane with one or the other of the two principal meridians. There is, therefore, not only blurring but also obliquity of the image." "The retinal image is displaced toward the meridian of greatest curvature." "Let Fig. 1 represent a pair of eyes with hypermetropic astigmatism; in the left eye the strongest meridian is vertical, and a horizontal arrow throws its image upon the horizontal meridian of the retina. In the right eye the strongest meridian is at 135° , hence the image of the same arrow is deflected toward this meridian and falls upon the retinal meridian 170° instead of 180° . As the two images do not fall upon corresponding parts of the retina, there is double vision, which is overcome by the harmonious action of the superior oblique muscles. The superior oblique of the right eye revolves it so as to bring meridian 175° of the retina in position to receive the impress of the oblique image (see Fig. 2), while at the same moment the superior oblique of the left eye has so revolved it as to bring meridian 175° to the horizontal, hence in position to receive the horizontal image. The oblique and horizontal images being now on harmonizing portions of the retina, there is no double vision." ⁶

This sounds all very plausible, but unfortunately for Dr. Savage's theory, the objects in nature are not all horizontal arrows, but present also vertical and oblique outlines, and it has already been shown by other critics (Dr. H. Wilson⁷ and Dr. F. B. Eaton⁸) that the supposed rotation which would bring the retinal images of a *horizontal* arrow upon corresponding meridians of the retina, would at the same time make the retinal images of a *vertical* arrow harmonize less than before the rotation. In the left eye of Figs. 1 and 2 the image of the vertical arrow would be on the vertical meridian

⁶ But this is not quite correct, for when the left eye is rotated 5 degrees its astigmatism has become oblique and according to Dr. Savage's own doctrine the image of the horizontal arrow could no longer be horizontal, hence would not be received on the meridian 175° when this meridian has been turned to the horizontal.

⁷ *Archives of Ophthalmology*, XXIII.

⁸ *Transactions of the Section of Ophthalmology*, meeting at San Francisco, 1894.

of the retina before and on the meridian 85 after the rotation, but in the right eye the image of the same arrow (displaced 10° toward the strongest meridian according to Dr. Savage's doctrine) would be on meridian 100 before and on 105 after the rotation; hence the vertical images would be separated more than before the rotation.

It does not seem likely that the eyes execute rotations which are so obviously useless, and a little further investigation will show that there is no necessity for them and that the obliquity of the retinal images which is supposed to make these rotations necessary, is not real but imaginary. Dr. Savage thinks the obliquity of the image in oblique astigmatism is demonstrated by the following experiment:*

"One who is emmetropic, or at least nonastigmatic, by placing a — 3 D. cyl. before each eye in trial frame, creates three diopters of hypermetropic astigmatism. The axis of the left cylinder being at 90° and that of the right eye at 135° he has made of his own eyes the kind represented by Fig. 2 (our Fig. 1.) He may now for a moment place the opaque disk in front of his right eye, at the same time placing the double prism (each 6°) before the left eye. A horizontal arrow, head to the left, having been drawn on a cardboard, he looks through his double prism and sees two horizontal, hence parallel, arrows. On removing the opaque disk from the right side of the trial frame, a third arrow appears between the other two, but not parallel with them—it is oblique down and to the patient's left."

I have given the exact copy of the doctor's own description. The reader, therefore, may form his own opinion as to whether this experiment sustains the view that oblique astigmatism causes an obliquity of the images of horizontal objects. In my opinion it does not; to me the whole experiment is only a roundabout demonstration of the well-known fact that horizontal (or vertical) lines viewed through a concave cylinder held with its axis obliquely before the eye, appear inclined toward the axis of the cylinder. But this apparent deflection of the lines from the horizontal (or vertical) direction rapidly decreases when the cylinder approaches

* *New Truths in Ophthalmology*, p. 12.

the eye and it disappears entirely when the cylinder, instead of being placed in a trial frame, is brought in the closest proximity possible to the cornea; which shows that Dr. Savage's own experiment proves the *absence* of obliquity of the retinal images in oblique astigmatism, if only we take the necessary precaution to imitate as closely as possible the optical conditions of the natural astigmatic eye.

But I believe the following demonstration must convince everybody that oblique astigmatism does not alter the position of the images on the retina, but that the retinal image of a horizontal line remains horizontal and that of a vertical line vertical. In the front of this glass case which I use for demonstrations in lectures on refraction, I have put a spherocylindric lens ($+10 \text{ C} + 2\text{c}$) which can be rotated in its setting so as to place the axis at any desired angle. Inside of the case we have a diaphragm (representing the pupil) to cut off the very peripheric rays and a piece of ground glass (representing the retina) which can be moved back and forth to change its distance from the lens as we please. Several feet in front of this refraction box I put a metal screen having a very narrow horizontal slit one inch long, which is well illuminated by a light behind the screen. This slit being exactly opposite the horizontal diameter of the spherocylindric lens sends its rays through the lens to the ground glass screen in the box; if this screen is now placed about 4 inches from the lens it is in the posterior focal plane and if the axis of our spherocylinder is vertical we see upon the screen a bright luminous horizontal line. Now, if I turn the axis of the cylinder 5 degrees to the left (to 95°), the image on the screen is still horizontal but has assumed a long rhomboid figure, its upper and lower line being exactly horizontal, its short sides slanting 5° upwards to the right. If I continue rotating the axis in the same direction you notice the sides of the luminous image become longer and more slanting, while top and bottom become proportionately shorter, but remain horizontal. When the axis of the cylinder arrives at 135° the figure is a regular rhombus, its sides slanting exactly 45° , and while the axis is traveling from 135° to 180° the sides grow longer than the top and bottom and gradually turn toward

the perpendicular direction; and when the axis arrives at 180 the image on the screen is a rectangle with well defined sides, but top and bottom blurred. You notice the slanting of the sides of the luminous figure corresponds always exactly with the obliquity of the meridian of greatest refraction, for which the screen is not adjusted¹⁰; but if we slide the screen a little forward to bring it in the focal plane of the strongest meridian and repeat the rotation of the cylinder axis, you will observe again the same change of the luminous image from a line to a rhombus and finally a rectangle; but you will see now the slanting of the sides follows exactly the axis of the cylinder. But whether the screen stands in the anterior or posterior focal plane you will observe that during all the revolution of the cylinder axis the transverse lines (top and bottom), which of course indicate the position of the image of the horizontal slit, never depart from the horizontal direction.

And if we turn the screen so as to make the slit a vertical line we can in the same manner convince ourselves that during all the changes the luminous image undergoes through the rotation of the cylinder from 180° to 90° and back, the sides of the image, which of course determine the position of the image of a vertical object, never depart from the vertical direction. Hence neither the image of a horizontal nor that of a vertical line shows during the rotation of the cylinder any obliquity in the sense of Dr. Savage's theory.

Nor do clinical tests sustain this theory. In a number of patients with oblique astigmatism I have tried the double prism test, following exactly Dr. Savage's directions as quoted above, but not one single patient could observe any obliquity of the middle line. The following case of mixed astigmatism seemed particularly favorable for the experiment. The R. E. had myopia 2.50 in meridian 115, and hypermetropia in meridian 25; the L. E. had M. 1.50 in meridian 65 and H. 5 in meridian 155. With correcting glasses $V = \frac{20}{20}$, and the patient, a very intelligent woman and good observer, noticed quickly the slanting of the floor and the other visual distur-

¹⁰It is obvious that the widening of the luminous figure is caused by the diffusion circles of the non-focussed rays.

tions so commonly produced by correcting cylinders with oblique axis. But tested¹¹ with the double prism she failed to notice any obliquity of the middle line; all three lines appeared perfectly parallel. And why should we expect a different result? Why should in oblique astigmatism a horizontal line not form a horizontal image on the retina? The refraction of the eye affects only the sharpness of the retinal image, but not its location. The location on the retina of the image of a luminous point is determined by what Helmholtz called the direction ray (*Richtungstrahl*) which forms a straight line drawn from the object point through the nodal point of the eye to the retina; where this direction ray touches the retina there the image of its object point is formed. If the object looked at is a horizontal line the direction rays connecting all its luminous points with the nodal point pass through the horizontal meridian of the cornea, and as this meridian has a regular curvature in oblique astigmatism, these rays proceed undeflected in their horizontal plane through the nodal point to the retina and form upon the latter a horizontal line.

It is therefore evident that neither experiments nor clinical observations nor the laws of physiological optics sustain the doctrine of the obliquity of the retinal images and the necessity of any action of the oblique muscles in oblique astigmatism. The theory rests on false premises and is wholly untenable.

¹¹ Of course without the correcting lenses.

THE LAWS OF PARALLEL OCULAR MOTION AND
THEIR MISSTATEMENT IN TREATISES
AND TEXT-BOOKS.

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A SERIOUS discrepancy exists between the laws of parallel ocular motion as formulated by Listing and Helmholtz, and their statement and interpretation by the authors of nearly every treatise and text-book wherein they are described. I propose to demonstrate that in consequence the descriptions given in these works of certain parallel movements of the eyes are incorrect as regards the position of the vertical meridian of the retina, and hence of the whole retina and eyeball. Further, that this in turn has led to erroneous statements as to the role played by the various muscles in the production of these movements. Finally, I propose to show that these misconceptions must lead to errors of diagnosis of certain pareses, paralyses and abnormal muscular tensions (heterophorias).

Since spectral or after-images follow the movements of the eye with absolute exactness, they are especially adapted for the detection of movements such as torsions or rotations on the visual axis, not otherwise appreciable. The experiments of Donders with the spectral image of a vertically suspended colored thread are the ones most often detailed in text-books.¹ Following, however, Le Conte, who has given the clearest and best methods of experimenting with spectral images,²

¹ Alfred Gräfe's *Klinische Analyse der Motilitätsstörungen des Auges*."

² *Sight*, p. 164, 165, et. seq.

we find that gazing in a darkened room at a rectangular cross-slit in the window until branded upon the vertical and horizontal meridians of the retina and throwing the spectral image thus formed, by moving the eyes only, into the corners of a vertical wall, it is distorted as seen in Fig. 1.

In order to measure the *amount* of torsion, Le Conte covered his experimental plane (wall) with rectangular co-ordinates, vertical and horizontal, and by experiment found, for extreme oblique positions, the torsion of the vertical arm of the spectral cross on the vertical lines of the experimental

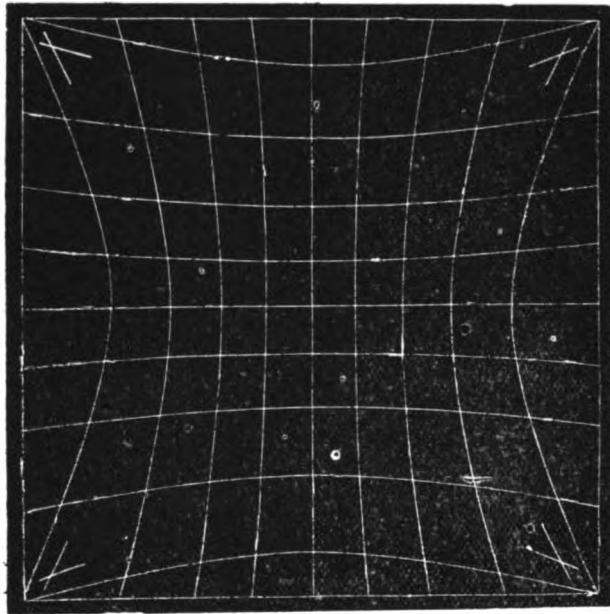


FIG. 1.

Diagram showing the inclination of vertical and horizontal images on a vertical plane for all positions of the line of sight. [Le Conte.]

plane to be about 15° , but the torsion of the horizontal arm on the horizontal lines only 5° . Putting his results together he produced the diagram Fig. 1, which gives the position of the vertical and horizontal arms when projected on a vertical plane for all positions of the line of sight. In order to eliminate the errors of projection on a vertical plane surface, he next used the sky as the plane upon which to project the

spectral images, it being everywhere at right angles to the line of sight, and constructed the diagram shown in Fig. 2, which represents the torsion of the undistorted spectral cross when projected upon a spherical concave surface for every position of the visual line, since the cross formed by every intersection of the lines represents the position of the spectral image when the gaze is directed to that point.

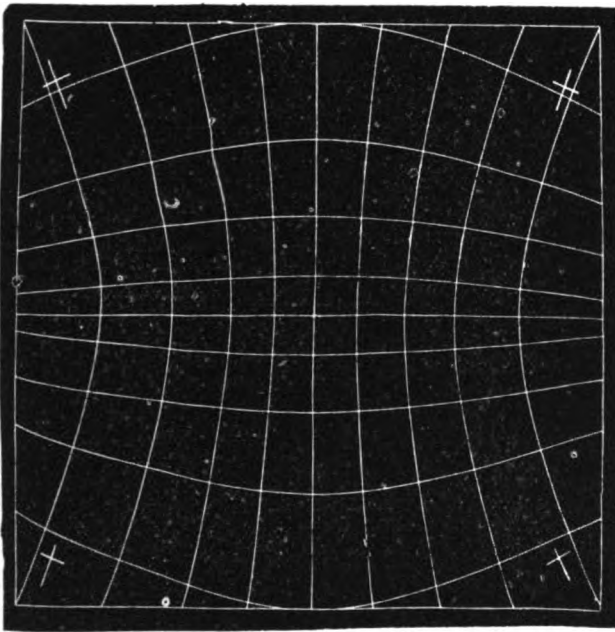


FIG. 2.

Diagram showing the inclination of the undistorted spectral cross when projected on a spherical concave surface, for every position of the line of sight. [Le Conte.]

In both Figs. 1 and 2 the torsion of the vertical arm of the cross conforms to the positions given it by Donders, and since the spectral image exactly follows the motion of the eye, he assumed (incorrectly, as we shall see), that the vertical meridian of the retina inclines similarly with regard to the median plane of the head; hence he formulated the following laws:³

³ Alfred Gräfe's *Klinische Analyse der Motilitätsstörungen des Auges.*"

1. In looking in the horizontal plane, straightforwards, to the right or left, the vertical meridian suffers no inclination, but remains vertical.

2. In looking in the vertical meridian-plane, straight forwards, upwards or downwards, the vertical meridian also remains vertical.

3. In looking diagonally upwards to the left, the vertical meridians of both eyes are inclined to the left and parallel (that of the left eye slanting outward, that of the right inward.)

4. In looking diagonally downwards to the left, the vertical meridians of both eyes are inclined to the right and parallel (that of the left eye inwards, that of the right outwards.)

5. In looking diagonally upwards to the right, the vertical meridians of both eyes are inclined to the right and parallel (that of the right eye outwards, that of the left inwards.)

6. In looking diagonally downwards to the right, the vertical meridians of both eyes are inclined to the left and parallel (that of the right eye inwards, that of the left outwards.)

Not only is it natural to infer that in the four diagonal positions the vertical meridian is inclined in the same direction as its projected spectral image, but such an inference is apparently unavoidable. Accordingly nearly every treatise and text-book of ophthalmology has recognized Donder's laws as correct, either directly by quotation, or indirectly in describing the position of the vertical meridian in paralyses; among these are the works of Soelberg Wells, Schmidt-Rimpler, Meyer, Macnamara, De Wecker, Stellwag, Carter and others.⁴ It appears, therefore, that these laws are not only accepted by ophthalmologists generally, but are applied clinically as guides in the diagnosis of muscular anomalies.

Nevertheless, if we turn our attention from the spectral image to the eye itself, a few very simple experiments will show that in all diagonal positions the direction in which the

⁴Panas in his "Traite des Maladies des Yeux," 1894. the last authoritative work on the eye, makes the same error. See vol. II, page 9. "It is to these inclinations that Helmholtz has given the name *wheel movements*. He distinguishes them as *positive* and *negative*, according as the inclination is in the direction of the movement of the hands of a watch with its face toward the observer, that is, from left to right, or the contrary. * * * In binocular vision *upward* and to the *right*, and *downward* toward the *left*, the movements are *positive*, while they become *negative* in the opposite position."

vertical meridian inclines with regard to the median plane of the head is exactly opposite to that of its spectral image. If we take a hollow rubber ball, or an apple, and thrust a steel knitting-needle vertically through the side nearest us to repre-

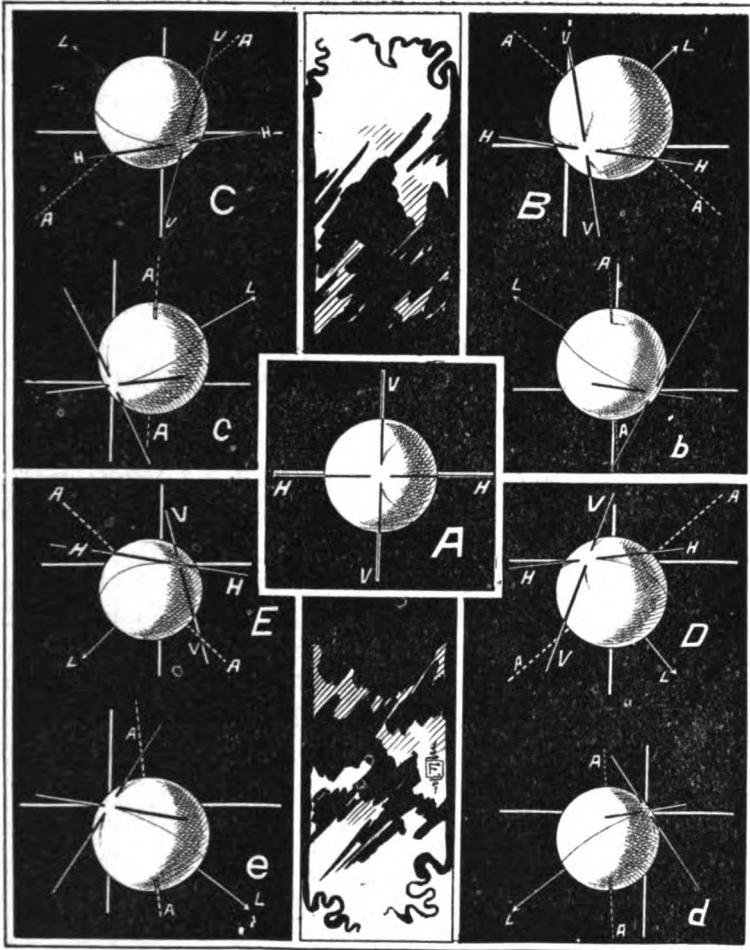


FIG. 3.

Rubber ball showing position of vertical and horizontal meridians of retina viewed from behind when looking: B, up to right; C, up to left; D, down to right; E, down to left. A, primary position; b, is B viewed from left side; c, is C viewed from right side; d, is D viewed from left side, and e is E viewed from right side. In each cut A-A is axis of rotation; V-V, vertical meridian; H-H, horizontal meridian; L, visual line. The unlettered vertical and horizontal white lines in each cut are on the background. (In each position the ball has been rotated slightly more than 45° . When rotated exactly, 45° the horizontal meridian H-H is still horizontal.)

(From photographs by author.)

sent the vertical meridian of the retina, and another horizontally through its center from before backwards to represent the visual line, their intersection will represent the yellow spot with the eye in the primary position (see Fig. 3, A.) It is clear that from this primary position the visual line can be directed to a point diagonally upward to the right (say 45° to the right and 45° upward), in three different ways. *First.* By rotating the ball on its vertical axis 45° to the right, and then 45° backwards on its now obliquely placed transverse axis. When this is done (the ball held on a level with the eyes), we find that the vertical meridian (needle) is inclined backward, *to the left* (Fig. 3, B, V—V) with regard to a vertical line on the wall in front, and not to the right, as stated by Donders. *Second.* By rotating the ball on some axis which will cause the visual line to move diagonally upward to the right in a straight line. A little experimenting soon proves that the only axis on which this can be accomplished is one represented by a needle thrust through the center of the ball diagonally downward from left to right, perpendicular to the visual line and at an angle of 45° with the vertical meridian; in other words, an axis perpendicular to a straight line joining the first and second positions of the visual line (points of fixation.) (See dotted line A—A, Fig. 3, B). Rotating the ball backward on this axis, we find that the visual line (needle) moves diagonally upward to the right in a straight line, and that the vertical meridian is inclined backward *to the left* into precisely the same position as when the ball was rotated to the right and then upward. It is to be especially noted that in neither case there is any rotation on the visual axis. *Third.* By rotating the ball backward on its transverse axis 45°, and then 45° to the right on its now backwardly inclined vertical axis. Carrying out these movements we find that while the visual line is directed correctly, the vertical meridian, though inclined backward as before, remains parallel to a vertical line on the wall in front. To give it the same position as in the first and second instances, we must rotate the ball *on the visual axis to the left*; it then for the third time has the position shown in Fig. 3, B; otherwise, in the case of the eye itself, the retina would not

correctly perceive objects, since the vertical meridian would be inclined to the right relative to a really vertical object straight in front of it in the new position. As to the three remaining diagonal positions, each can be attained in the three ways just described, the resulting inclination of the vertical meridian in each instance being as portrayed in Fig. 3, C, D and E, and opposite in direction to those given by Donders and the text-books. Moreover, it makes no difference by which of these three ways the diagonal position is reached, the inclination of the vertical meridian will be the same, for: "Each position of the visual axis has its own invariable angle of torsion—a value independent of the manner in which the visual line is carried to that position." (Helmholtz.)⁵

Now, the law which covers all the phenomena I have described, and is accepted by physiologists, is that of Listing:

*"When the visual line passes from the primary position to any other position, the angle of torsion of the eye in its second position is the same as if the eye had come to this second position by turning about a fixed axis perpendicular both to the first and second position of the visual line."*⁶

Thus, in looking straight upward the visual line moves vertically, and the only axis perpendicular to this course is the transverse horizontal axis of the eye, the vertical meridian remaining vertical; in looking horizontally to the right or left the only axis perpendicular to this course is the vertical axis of the eye. Again, if the visual line be carried from the primary position upward to the left to a point on a straight line, which makes an angle of 10° with the vertical, the inclination (torsion) of the vertical meridian of the retina to the right will be the same as if the eye came to this *secondary* position by rotating on a fixed axis passing through the center of rotation of the eye downward to the left at an angle of 10° with the horizontal. In fact, the eye would rotate on such an axis instead of one making an angle of 45° , as in C, Fig. 3, and so on for every point to which the visual line is carried from the primary position.

⁵ *Physiologie Optik*, French Ed. 1867, p. 602.

⁶ *Ibid.* p. 606.

But as we have seen, torsion (rotation) *on the visual axis* occurs whenever, with the visual line elevated or depressed, it is carried to the right or left; hence Helmholtz formulated the following laws, which, however, are contained in and deduced from Listing's law:

"When the plane of sight is directed upward, lateral displacements to the *right* make the eye turn to the *left* (Fig. 3, *B*), and displacements to the *left* make it turn to the *right* (Fig. 3, *C*).

When the plane of sight is depressed, lateral displacements to the *right* are accompanied with torsion to the *right* (Fig. 3, *D*) and those to the *left* with torsion to the *left*." ⁷ (Fig. 3, *E*).

But it may be asked: What proof is there that the vertical meridian does not incline in the same direction, as its spectral image is plainly seen to do when thrown diagonally upward or downward upon a concave surface, as in Fig. 2? Because the inclination of the spectral image is *apparent*, not real, the cross being *referred to a new vertical meridian of space*. This is readily illustrated by holding the ball on a level with the eyes and in the primary position (Fig. 3, *A*) and rotating it backward on the oblique axis A—A (Fig. 3, *B*). During this movement the cross V—V, H—H, *apparently* rotates to the *right*, though on referring the vertical meridian V—V to a vertical line on the wall in front we correct this impression and perceive that its *real* inclination is to the *left*. Fixing the ball in this position (Fig. 3, *B*) and regarding it from its left side (Fig. 3, *b*), though we know it has not moved, the cross appears rotated far to the right, especially when referred to a vertical line on the right-hand wall of the room. What was *front* and *rear* in the position shown in Fig. 3, *B*, has become *left* and *right* respectively in the position shown in Fig. 3, *b*. It is the same for the other diagonal positions; in Fig. 3, *c* is *C* viewed from its right side; *d* is *D* viewed from its left side, and *e* is *E* viewed from its right side.

The four crosses in *b*, *c*, *d* and *e* representing the apparent torsion and corresponding in inclination to the four corner crosses in Fig. 2, each of which is the spectral image of the vertical and horizontal meridians of the retina when the vertical meridian is inclined in the *opposite* direction relative to

⁷ Ibid, p 602.

the median plane of the head; *i. e.*, as in *B*, *C*, *D* and *E* respectively. Indeed, since a spectral image accurately follows the movements of the branded meridian, and when thrown upon a concave spherical surface is its true projection, the apparent inclination of the vertical meridian in a given position of the visual line necessarily determines an apparent inclination of its spectral image. If this be still doubted, the following experiment, which I have repeatedly verified, will, I believe, prove convincing: In a perfectly darkened room excite a spectral image by gazing at a vertical incandescent lamp, one-half of the filament being covered by a card. Put out the light and turn around a number of times until all knowledge of the position of the walls of the room is lost; then move the eyes while open into the four diagonal positions. The spectral image in each position inclines as in Fig. 2. Now, since the image is a strictly subjective one, its inclination must be due, in the absence of a surface of projection, to mental impression alone, and therefore to the estimate of direction and position resulting from the consciousness of the voluntary innervation of certain muscles and the consequent movement of the eyes.

But the error of the text-books does not end with false teaching of the movements and positions of the eye, for the necessary result of this is equally false doctrine concerning the combined action and relative tensions of the various muscles which produce these movements. As an illustration, I quote from the treatise of Soelberg Wells concerning the diagonal upward and outward movement of the eyes, which is described in a similar way in the other text-books:

"In moving the eye diagonally upwards and outwards, the vertical meridian being inclined outwards, the superior rectus acts in conjunction with the external rectus. But as the latter has no influence on the position of the vertical meridian, and as the superior rectus turns it inwards, we must call into requisition some other muscle which shall not only counterbalance the effect of the superior rectus upon the vertical meridian, but shall even more than correct it, and incline the latter outwards. The inferior oblique will be able to do this, for the eye is now in the position (upwards and outwards) in which the inferior oblique acts most upon the vertical meridian."⁸

⁸A Treatise on the Diseases of the Eye, third Amer. Ed., p. 670.

We have seen that in this upward movement to the right the vertical meridians are inclined to the *left*; neither is it correct to state as in the quotation that the external rectus "has no influence on the position of the vertical meridian," for:

"If the visual line be first raised by the combined action of the superior rectus and of the regulating inferior oblique, and the internal rectus be innervated, it no longer acts in a horizontal direction only. Its point of insertion is also elevated and its belly forms a different angle with the visual line. Its tension must therefore cause a further elevation of the inner; i. e., a sinking of the outer half of the horizontal retinal meridian, and with it a rotation around the visual line." (Hering)."

It is obvious that the innervation of the external rectus must, with an elevated visual line, similarly incline the meridian to the left. Not only this, it can be proved that such torsional effect of the lateral recti is necessary in oblique movements to preserve parallelism of the vertical meridians and a correct position of the retinae. To make this clear and to establish a measure of relative muscular torsion, I ask attention to the following simple demonstration: Since in the primary position the planes of the superior and inferior recti make an angle of 23° with the visual line, their *torsional* angle is 23° and their *traction* (elevating and depressing) angle is $90^\circ - 23^\circ = 67^\circ$. In the same position the planes of the obliques make an angle of 55° with the visual axis; their torsional angle is therefore 55° and their traction angle $90^\circ - 55^\circ = 35^\circ$. Now, in moving the eye from the primary position vertically upward, the inward torsion of the superior rectus is neutralized by the outward torsion of the inferior oblique and the vertical meridian remains vertical. It therefore requires $\frac{55}{23} = 2.39^\circ$ of torsion of the inferior oblique to neutralize 1° of torsion of the superior rectus. This ratio of $1:2.39$, I term the *relative torsion-angle*, and each degree of torsional traction of the superior rectus a *torsion angle*. To show its application, let us suppose that a position upward to the right be accomplished by rotating both eyes horizontally 23° to the right and then 20° vertically upward. That the

⁹ *Die Lehre vom binocularen Sehen. Leipzig, 1868.*

vertical meridian of the *right eye*, in accordance with Listing's law shall assume the position shown in Fig. 3, *B*, during the upward movement there must be no rotation on the visual line (torsion). But in this position, 23° to the right, while the plane of the inferior oblique makes an angle of $55 + 23 = 78^\circ$ with the visual axis, the plane of the superior rectus now coincides with this axis; hence it has no torsional effect. $78 \div 2.39 = 32.6$ *torsion angles* exerted by the inferior oblique, which is the amount of torsion to be furnished by the external rectus to neutralize the torsion of the oblique.

In the *left eye*, rotated also 23° to the right, the plane of the superior rectus now makes an angle of $23 + 23 = 46^\circ$ with the visual axis = 46 torsion-angles, while the plane of the inferior oblique makes an angle of $55 - 23 = 32^\circ$. $32 \div 2.39 = 13.6$ torsion-angles, and this deducted from the 46 torsion-angles of the superior rectus (since the torsion is opposite) gives *32.6 torsion angles*, to be furnished by the internal rectus to neutralize the inward torsion of the superior rectus, *precisely the same amount called for in the case of the external rectus*.

If the same position be attained by a rotation first upward on the transverse axes and then by a rotation to the right on the now backwardly inclined vertical axes, the internus and externus must again be the means of producing the necessary inclination to the left of the vertical meridians; in this case, however, producing torsion on the visual axis, all the muscles finally having the same relative tensions as in the first instance.

Finally, if the position be attained by a diagonal movement in a straight line, the relative innervation and traction of the three muscles of each eye will again be the same, and the resulting axes of rotation, agreeable to Listing's law, will be perpendicular to the diagonal movement (*A—A*, Fig. 3, *B*).

That misconceptions of the true position of the retina and of the physiological action of the muscles may lead to errors of diagnosis of certain pareses and paralyses, seems more than probable when we find that authors assign to the vertical meridians in paralyses positions in accordance with their erroneous conceptions of the physiological action of the mus-

cles. The following description by Stellwag of the position of the vertical meridian in diagonal movements in paralysis of the externus is representative of that given in other treatises:

“ * * * In diagonal directions of the glance towards the side of the paralyzed muscle, a false inclination of the meridian then occurs. * * * If the glance is turned downwards and towards the side of the paralyzed muscle, the axis of rotation of the affected eye lies more horizontally than that of the healthy eye; while the vertical longitudinal median section of the latter inclines very far outwards, the longitudinal median section of the paralytic eye is inclined but a little inwards, and the double images must correspondingly converge upwards, on account of their being homonymous.”¹⁰

According to the above, if, in a case of paralysis of the right externus, the glance is turned downward to the right, the vertical meridian of the left healthy eye (which is in the longitudinal median section) “inclines far outward,” i. e., to the left; whereas, by referring to Fig. 3, *D*, we see that really it inclines *inward to the right*, and that paralysis of the right externus would cause the right eye to rotate on an axis which lies more horizontally than that of the left, the result being that the vertical meridian of the right eye would be nearly perpendicular and converge *upward* with that of the left, not being inclined so far to the right. The images would therefore *diverge* upwards. These inclinations of the false image are not always present, even in apparently uncomplicated paralysis of the externus, and this seemingly because of compensatory spasmodic action of the superior and inferior recti, which action is generally made evident some weeks after the onset of the paralysis by one image appearing to the patient to be nearer than the other, an illusion due to a difference in level of the images and the introduction thereby of apparent perspective.¹¹ Such compensatory action in ocular paralysis has long been recognized.

¹⁰Treatise on Diseases of the Eye. Fourth Amer. Ed., p. 845.

¹¹The following notes of a case of paralysis of the right externus have kindly been communicated to me by Dr. Alex. Duane, of New York:

“V. J. Female (colored), 45 years of age, came to Vanderbilt clinic on February 5. Stated that in the beginning of January she was

In conducting the examination of a case of ocular paralysis, it is often advisable to preserve the ideal horizontal visual plane, the sound eye first fixing the object while in the primary position; then, in order to bring into action one or more muscles, instead of moving the object the head is inclined on its horizontal or vertical axis. Only in this way, in certain cases, can the true inclinations and relative positions of the images be ascertained.

The bearing of the laws of ocular motion upon the diagnosis of heterophoria is as important, though less evidently so, as upon the diagnosis of paralyses. In his late able paper, "Paralysis of the Superior Rectus and Its Bearing on the

attacked with severe headache and was delirious, and that four days later diplopia developed. In a few days headaches grew less severe and then ceased. Diplopia has persisted ever since. The two images usually appear side by side, but latterly one has seemed to be back of the other. I examined patient on February 19th. Excursion of right eye limited outward (eye makes rather more than half its usual excursion, and abduction evidently difficult to maintain). Homonymous diplopia at all distances in looking straight forward and increasing rapidly as the object is carried to right. If object is carried from left to right diplopia does not begin to occur until the median line is reached. In the right half of the field of fixation, particularly above, there is a vertical diplopia, with the image corresponding to the right eye below. This varies considerably in amount from time to time, and while repeated examinations prove that the patient is always consistent as regards the character of the diplopia, she does not always agree as to the way it changes, sometimes averring that it diminishes as the eyes are carried toward the middle line, and also as they are carried down. This latter seems to be really the state of the case. *In all parts of the field the double images are said to be strictly parallel*, and this no matter what distance they are placed from the patient and whether tilted to one side or the other or tilted or not toward the patient. Nor does it make any difference whether they are projected or not, the answer was invariably the same; i. e., that the images were parallel. The examinations were made in all parts of the field of fixation and especially in the extreme upper and right hand portion. I may add that the pupillary reactions were normal and the accommodation unaffected. V. $\frac{2}{3}$. H. of 1 D. or more. The vertical diplopia I cannot regard as paralytic; if it were it would indicate a paralysis of the left inferior oblique (if the vertical diplopia is admitted to have increased in looking up to the right), and the left eye seemed to be unaffected. I should rather, from its very changeable character, regard it as due to a spasmodic action of the right superior rectus, which would produce a diplopia in this sense and situation."

Theory of Muscular Insufficiency,"¹² Dr. Duane remarks: "I am convinced from a consideration of the symptoms which they present that many cases of hyperphoria which I examined before my attention was called to this subject (paralysis of the Sup. rectus, E.), and the necessity of testing for diplopia in all parts of the field of fixation, were really instances of this affection." He also contends that " * * * just as we may have a paralytic or spastic squint, we may have a paralytic or spastic heterophoria." It needs no argument then to prove that an intimate and correct knowledge of the position of the retinae in all positions of the visual line in the field of fixation is a necessary foundation for the solution of the complex problems which often present themselves in cases of heterophoria. More than this: I have shown (*Ophthal. Record*, March, 1895), that certain theories of so-called insufficiency and of compensatory action of the oblique muscles in oblique astigmatism are proved to be without foundation when we realize that torsion is largely, if not principally, the result of action of the lateral recti.

While the expositions and illustrations here given have, I trust, made clear the origin of the errors concerning the physiology of ocular movements found in treatises and text-books, it is not so easy to account for their continued existence thirty years after the appearance of the classic work of Helmholtz and the writings of such accurate observers as Hering, Listing and A. Fick. The vitality of such errors certainly indicates that the training in physiology of neither the ophthalmologist of this or any other country is yet what it should be, and serves to emphasize the earnest admonition which the pupils of Agassiz tell us he gave them: To seek truth rather in the faithful study of Nature than within the covers of books.

¹²*Archiv. of Ophth.*, vol. XXIII., p. 61.

HYPERMETROPIA OF HIGH DEGREE, WITH A
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ABSOLUTE Emmetropia is rare, and the normal refraction of the human eye is probably hypermetropic; certainly this is throughout life the most common optical error. Under normal conditions the eye, which at birth is hypermetropic to a considerable degree, shares in the growth of the individual and increases in size without notably disturbing the relations of its several axes. This growth is accompanied by a gradual decrease in the curvature of the crystalline lens. The ideal result of such development is a gradual decrease, and the final disappearance of the infantile hypermetropia. Often, however, the change is arrested before this condition is established, either because the error is excessive or the sclera too rigid to permit the necessary expansion. Less frequently, but especially in the presence of pathological thinning of the ocular coats, this distension of the globe continues and the eye passes into myopia, when it becomes subject to all the dangers incident to the latter state.

Hypermetropia, even when extreme, lacks much of the interest which rightfully attaches to myopia, and offers many points of difference. It is always congenital and shows little or no tendency to increase. There are no recognizable lesions peculiar to this condition except those of dimension; disease of the retina and choroid being extremely rare and coincidental. Concerning the acquired hypermetropia of later life, it is perhaps safe to consider this a pre-existing error becoming manifest through failure of the accommodation. Peculiarities of contour, particularly of the face, are by no means

constantly present. There exists a very manifest relation between hypermetropia and microphthalmus; both are results of an incomplete growth of the organ, and the terms simply indicate degrees of the defect; marked impairment of the retinal function offers perhaps the most rational basis for a proper division.

For the purpose of this paper I have selected cases in which both eyes were hypermetropic to the extent of 5 diopters or more in the higher meridian, all cases of aphakia and all those presenting opacities in the media being excluded. With a very few exceptions, all patients under 35 years of age were examined after complete paralysis of accommodation, usually secured by repeated instillation of solution of atropin, and even in middle life strong solution of homatropin was frequently used. Examination was by the ordinary subjective methods, verified by the ophthalmoscope and shadow test, illiterate and very young subjects being of course examined by objective methods alone.

Of 1789 refractions in hospital* and private practice, 58 cases, or 3.24%, met all the above conditions. The highest degrees occurred in two sisters. A., 6 years of age, R. E. 13 diopters, L. E. 12 diopters; and K., 4 years of age, R. E. 11 diopters, and L. E. 10 diopters. Altogether seven eyes presented errors of 10 diopters or more. In one patient 48 years of age, the defect amounted to 11 diopters in both eyes, showing that errors of high grade are by no means confined to the young. Astigmatism was present in both eyes in twenty-three cases and in one eye only in three additional, making a total of 49%, in all of which except three the axis was approximately vertical, the exceptions being cylinders of low degree. Astigmatism would seem to be distinctly less frequent in the high degrees of hypermetropia; only one instance occurred in an eye possessing a defect exceeding nine diopters.

Owing to illiteracy or extreme youth, no vision is recorded in 9 cases; of the remainder, 10 eyes possessed vision of $\frac{6}{6}$ and 9 others of $\frac{6}{80}$, making a total of 18.5% in

*I am indebted to Dr. A. D. Hall for access to the records of his clinic at Wills' Hospital during my term of service with him.

which visual acuity may be considered good. Vision of less than one-fourth of the normal existed in 7 eyes. With correcting glasses vision of $\frac{5}{6}$ was obtained in 36 eyes, and of $\frac{6}{9}$ or better in 63.+%. Where the error exceeded 6 or 7 diopters and when complicated by high degrees of astigmatism, the above result was not obtained. Simple reduced vision was the only subjective symptom in 36% of these cases, all others seeking relief from more or less violent asthenopia or reflex disturbances of the usual types. This latter group includes all the astigmatic cases, and with a few exceptions those in early life. No chorea, epilepsy, or other grave reflex phenomenon was noted. It does not appear that the symptoms differed materially in severity from those caused by defects of lower grade; of the histories furnishing satisfactory notes on this point only four gave evidence of unusual violence. In this connection it is of interest to know that 35 patients (28 being under the age of 25 years) had never worn glasses. In a very few instances very young patients brought small objects very close to the eye, preferring to ignore the circles of dispersion in order to secure larger images; such cases are almost invariably considered by family and friends to be "near-sighted."

A characteristic of the hypermetropic eye is its power of securing good vision by excessive action of the accommodation, which is made possible by hypertrophy of the ciliary muscle, mainly its circular fibers. In cases of high degree the demands upon this muscle are very great, and it is astonishing how long it can respond without complaint. Unfortunately complete records of the *total* accommodation cannot be given, but instances in which hypermetropia of 5 diopters was masked and apparently perfect vision at the ordinary reading distance obtained, are by no means rare. In one case 7.5 diopters was unsuspected during the exacting school years and first became manifest at the age of 15. Assuming that this patient selected a reading distance of 33 cm., he would have required 10.5 diopters of accommodation for this purpose. The presence of a very slight amount of astigmatism is sufficient to prevent this result from compensatory action of the ciliary muscle.

Hypermetropia is recognized as the most important factor in the production of convergent strabismus, being present in at least 85% of all such cases. Taking the totals as reported for five recent years at Wills' Hospital, in this city, convergent squint occurs in 8.9% of all hypermetropic patients; and admitting the errors inseparable from figures so obtained, this proportion is perhaps fairly accurate. In the group of high hypermetropia under discussion, there were sixteen cases of convergence, or 27.6%, indicating a much greater frequency than with low errors, although the contrary has been considered by most observers to be the case. There was no case of divergence. Concerning the supposed greater liability of the hypermetropic eye to glaucoma, these cases offer no testimony. Other complications, such as hordeoli and marginal blepharitis were present rather infrequently, the liability being probably that of ametropia in general.

It is impossible to ignore the influence of heredity in errors of refraction, but that hypermetropia of high degree is transmitted from one generation to another as is myopia of the same grade, seems improbable. I can present but few facts in support of this opinion, but it is of interest to note that my highest cases, the sisters previously mentioned, are the only children of parents having each but one diopter of hypermetropia. Very recently I have examined several members of another family. The father has a simple error of 1.5 diopter in both eyes and the mother a similar defect of 1.25 diopter. One daughter, aged 16, has an error in the R. E. of 5.25 and in the L. E. of 5.75 diopters; a son, aged 12, is wearing R. E. 6 and L. E. 6.50 diopters, both cases having moderate astigmatism. A third child wears strong "far-sighted" glasses which I have not seen, while the fourth and youngest child, who has just begun school, is presenting the characteristic symptoms of such a defect.

Concerning the treatment of this condition there can scarcely be two opinions. All such patients should be carefully refracted as early as possible and glasses given for constant wear. As a rule they accept glasses readily, but young subjects will rebel against immediate full correction, and in practice it is wiser to make a liberal reduction in the first

glasses; their strength can later be gradually increased without causing annoyance. Treatment of the complications need not be discussed here.

Without attaching undue importance to the evidence furnished by such a small group of cases, I wish to present briefly the following conclusions concerning hypermetropia of high degree:

1. It is always congenital and without tendency to increase. In children a decrease may be expected.
2. It presents no characteristic lesion of the choroid, retina, or media.
3. Astigmatism is present in about 50% of these cases, but decreases in frequency as the error becomes higher.
4. The severity of the asthenopia does not bear any close relation to the degree of the defect.
5. The principle complication is convergent strabismus, which is more frequent than with lower degrees of the error.
6. The influence of heredity is not clearly defined.
7. Early constant correction is indicated in all cases, and becomes imperative when strabismus is present as a complication.

117 South Seventeenth Street.

A NEW OPERATION FOR THE ADVANCEMENT
OF THE RECTI.BY CHALMER PRENTICE, M. D.,
OF CHICAGO.

IN all advancement operations the tying of the ligature is a question of judgment, and at the best we can only approximate the change of position. By such operations we can never hope to obtain anything like a uniform accuracy in the change of the position of the eye, for the small difference of one *millimeter* may mean several degrees of deviation of the optic axes in one direction or the other. By my operation with the ligature plate there will be much greater accuracy in attaining the desired position of the eye.

The ligature plates are made of aluminum. They are about three *millimeters* in width, and vary in length from about four *millimeters* to twelve or more, and weigh from one-eighth to three-fourths of a grain. They are spherically curved so as to fit the contour of the eye, their curvatures being in varying diameters to meet the requirements of different sizes of eyes. The plate is slightly notched at each end, and has a groove running its entire length on the convex surface from one notch to the other, into which the ligature falls and is out of the way of producing any irritation. (Fig. 1.)

FIG. 1.
Ligature Plate.

An incision is made through the conjunctiva and Tenon's capsule in the direction of the muscle beginning at its scleral attachment and extending along the middle line as far as it may be necessary. The muscle should then be entirely freed from capsular and ocular attachments. A Steven's hook is then passed behind the muscle and traction made toward the cornea; another hook is now passed behind the muscle from its opposite side and traction made in the opposite direction at the same time. The

point of the second hook should be forced outside of the capsule so as to expose the muscle to view; a small curved needle carrying one end of a ligature is made to enter one margin of the muscle as far back from its scleral attachment as is necessary, and pass as nearly as possible transversely through its fibers and come out on the opposite margin of the muscle. This engages many more fibers of the muscle than the passing of the ligature directly through it. It also offers a much greater support to the ligature, there being much less likelihood of its tearing away; in fact, I have not known such an accident to occur in this operation. Each end of the ligature on its respective side is now passed from the under side through the margin of the muscle close to its scleral attachment. After the two ends of the ligature have been brought through these parts of the muscle the hooks are taken out. Each end of the ligature on its respective side is now brought through the conjunctiva from its under side at a point about four *milli-*

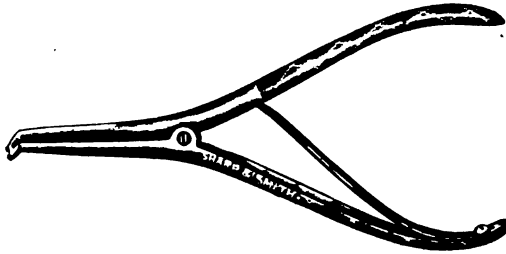


FIG. 2.
Ligature Dilator.

meters in the direction of the cornea from the scleral attachment of the muscle, the ends being about eight or ten *millimeters* apart, which the width of the scleral attachment should determine. The exits through the conjunctiva should be from three to four *millimeters* wider apart than the width of the scleral attachment. The two ends of the ligature should now be carefully tied by a surgeon's knot, not drawing the ligature so tight as to draw or pucker up very much the conjunctiva that it engages. Not much drawing forward of the muscle should be attempted in the first tying of the ligature; it should be tight enough to insure that all slack in the ligature is taken up. Or, where the conjunctival exits of the ligature were about eight *millimeters* apart, the tightening should be sufficient to draw them within four *millimeters* of each other. The knot should be very carefully and firmly tied. Two strabismus hooks may now be used or a ligature dilator made for the purpose, (Fig. 2) and traction in opposite directions can

be made, which now advances the muscle. The operator can now see about what length of a ligature plate should be used. The ligature plate is now firmly seized with a pair of forceps made for the purpose (Fig. 3) and one of its notched ends is made to engage one side of the ligature.* A somewhat strong Steven's strabismus hook is now used to make traction on the opposite side of the ligature, and to slip it over into the notch on the other end of the ligature plate. The forceps and hook are now removed and the ligature and knot fall into the groove on the ligature plate, so that there is no possibility of its coming in contact with the conjunctiva and giving rise to even that amount of irritation caused by an ordinary ligature.

An examination can now be made to ascertain the exact position of the eye and the amount of advancement that has been accomplished. If it is not sufficient, a ligature plate of greater length

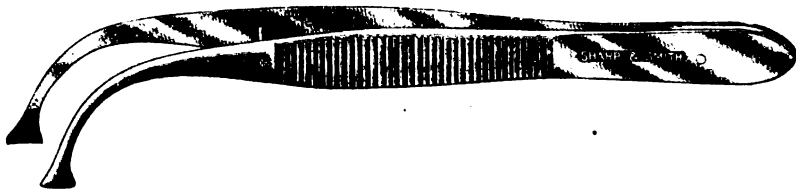


FIG. 3.

Forceps for holding ligature plate.

can be made to supersede the first. If too much advancement has been made a shorter ligature plate can be used. The ligature plate, if of a proper shape and carefully made, never gives rise to the slightest irritation; its presence is not even felt by the wearer, and it should be left in for three or four days.

When the operation is made without cutting the tendon, the muscle is tucked or folded upon itself and the inflammatory action that follows fastens it in this position. The slight bunching or enlargement that results from the folding is soon entirely obliterated by absorption. After that stage of the operation where the ligature has been passed through the muscle the first time, a portion of the muscle can be cut away if it is deemed advisable. Unless the amount of advancement is very considerable, the operation will generally prove fully as satisfactory without cutting the muscle. By this operation I have changed the position of the eye 30° without cutting the muscle.

*These instruments are made by Messrs. Sharp & Smith, of Chicago.

Modifications of the above operation can be advantageously made in which this plate is still very useful. Where the conjunctiva is sufficiently strong to withstand the necessary traction, that stage of the operation where the ligatures are passed through the muscle at its scleral attachment may be left out, and after the ligature has been passed through the muscle far enough back, the two ends may be brought out through the conjunctiva on their respective sides, eight or ten *millimeters* apart, as close to the cornea as possible. If the conjunctiva is sufficiently strong to stand the dragging, the ligature plate prevents it from puckering up and offers the advantage of increasing or lessening the effect of our operation, at the same time hiding the ligature from any touch with the palpebral conjunctiva. In all the old operations, after the ligature has been tied, if the position of the eye is not satisfactory, any alteration involves a new ligature and another operation, whereas with the ligature plate these alterations can be made by substituting plates of different lengths.

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IS GLAUCOMA CURABLE WITHOUT OPERATION?

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PERHAPS no class of scientific inquirers have more need to lend an attentive ear to the trite monition "go slow" than ophthalmologists. They very naturally become enthusiasts, finding their greatest satisfaction not so much in the utilization of accepted facts and methods as in the investigation and development of new ones. And it is to this spirit of enthusiasm which inspires the *personnel* of our special branch of medicine that much of its progress is due. It is our vantage as well as danger ground, for enthusiasm, if not properly restricted and tempered, is likely to place its votary astride a "hobby." Once there, mere coincidences are liable to be exalted into facts and promulgated as such. From that infirmity some of the ablest and most conscientious ophthalmological workers in times past have not been entirely exempt. Obviously *time* must be an important element in determining whether a given set of occurrences are really facts or only coincidences. The following observations are submitted with this conviction steadily in view and with the hope that the error above referred to will not be committed.

Thoroughly realizing that "two swallows do not make a summer," I wish to put upon record as succinctly as possible, brief notes of three cases of glaucoma (seen within the past 17 months), the treatment and results. This contribution is not offered dogmatically or as an affirmative statement of fact, but rather interrogatively, in the hope that other of our confreres will be disposed to pursue the subject further until it is determined definitely whether the apparently successful termination of these cases without iridectomy was coincidence or the legitimate result of treatment. It is not presumed that putting on record the histories of these cases can accomplish more than to stimulate further investi-

gation along the lines and in the channels herein indicated. If such result is reached, the writer's present purpose and desire will have been abundantly met.

It is quite generally agreed among ophthalmologists that notwithstanding the introduction of iridectomy by Von Gräfe, we are yet very far from having heard the "last word" both as to the etiology and treatment of glaucoma. Nor will it be denied that there is at present a lack of substantial unanimity as to the exact pathology of this disastrous ocular disease. It will, I think, be generally conceded by those who have closely followed the subsequent histories of their glaucomatous cases that, while iridectomy *temporarily arrests* the disease and that, too, for a period more or less prolonged, it rarely, if ever, *cures*. Certainly no fact in the entire clinical domain of ophthalmology has more thoroughly impressed the writer than that however beneficent and valuable as a *means of relief* (as it unquestionably is), iridectomy cannot be relied upon to eradicate and cure the *condition* upon which the disease depends. Obviously we are attacking by our iridectomies the *results* rather than the pathological condition itself.

Moreover, the symptomatology of the disease as recorded by the various authorities writing upon the subject in recent years, is far from constant or uniform. While certain manifestations are present in every case, the disease frequently presents characteristics not strictly "classical" and quite outside the ordinarily accepted classification. Consider, for example, one of the most constant symptoms—*tension*. Has it not frequently occurred in the experience of others, as it has in that of the writer, that glaucoma, admitting of no doubtful diagnosis, has presented itself with little or no rise of tension? The opportunities for observation afforded during the past two years inclines me more strongly to believe that in glaucoma we have a *condition* rather than a disease *per se*. If this view is correct, we are enabled at once to account for and explain somewhat the vague and ill-defined phases which not infrequently characterize and makes the disease correspondingly difficult of recognition.

As briefly stated as is consistent with intelligibility, the following is an epitome of the observed features in the cases already referred to:

Case No. 1. A mechanic, 50 years of age, consulted me for a rapid diminution of visual power and great supra-orbital pain affecting both eyes, who stated that he was annoyed a great deal by "rings and circles" (halos) of light. Tension was very high,

the eyes imparting to the touch a sense of stony hardness; cornea highly anesthetic; anterior chamber very shallow. The ophthalmoscope disclosed *pathologic* cupping of both discs. Vision was reduced to less than $\frac{20}{200}$ in O. D. and $\frac{20}{160}$ in O. S. Field for form was concentrically contracted, especially on nasal side, while that for color was entirely abolished. Pulsation of retinal arteries unusually active; so pronounced, indeed, was the latter feature that patient insisted that he could count the number of his heart pulsations in the fierce "eye-throbs." The correctness of the diagnosis not being open to doubt, the serious nature of the disease was explained to the patient as well as the necessity for prompt performance of iridectomy. He peremptorily declined operative procedure. Realizing that further attempts at persuasion would prove futile in changing his determination, and with a realization of the dire consequences likely to ensue consequent upon non-interference surgically, it was felt to be a duty to advise the patient that he alone must accept the entire responsibility—that further connection with the case was declined. To the first clause of this proposition he very readily assented, but earnestly pleaded to have the "next best thing" done short of operative interference. His plea was so earnest and pathetic that I finally yielded with much reluctance to his importunity and gave him a solution of pilocarpin (4 grains to the ounce) to be instilled into his eyes every four hours till I next saw him. At the next visit he was no better. The orbital and supra-orbital pain was still intense, arteries pulsating furiously and tension more exalted. He had now been without sleep seventy-six hours because of pain. His appeal that something be done for his relief was pitiful in the extreme, but again he declined my renewed proffer of an immediate iridectomy. In sheer exhaustion of other expedients and resources, and because I was in the habit of using it in many other but less formidable conditions of ocular trouble, I proceeded to apply over each eye a mild galvanic current, the anode to the nape of the neck and the cathode, covered with moist sponge, over the affected eyeball, making gentle pressure as it was moved back and forth. At the end of a seance of fifteen minutes patient expressed himself as feeling a decided relief from pain. To my astonishment the pulsation and tension had materially diminished. I instilled a few drops of pilocarpin (this time 2 grains to the ounce) and directed him to call later in the day, when, finding the relief experienced at the earlier visit still persisting, galvanism was again applied. The second application sufficed to *entirely relieve* the pain with a still further reduction in pulsation and tension. Patient was given daily galvanizations for two weeks and thereafter thrice weekly for three weeks, at the end of which time tension was normal; anterior chamber also quite normal; cornea quite sensitive; while vision had risen in O. D. to $\frac{20}{70} +$ and in O. S. to $\frac{20}{60} +$. Field for form and color had greatly improved, but was yet far from normal. Disc still showed some excavation quite apart from the evidently deep physiologic cupping. Four-

teen months later there had been no recurrence of pain, halos of light or elevation of tension. Form and color fields had greatly improved since previous examination. Some pathologic cupping of disc was still slightly apparent, but no appearance of a progressive atrophic condition. Patient had previously been given this correction for distance:

O. D. +1.50 Cyl. Ax. $75^{\circ} = \frac{20}{40}$.

O. S. +1.10 Cyl. Ax. $165^{\circ} = \frac{20}{30}$.

with the added presbyopic spherical correction necessary for near work.

Case No. II. Book-keeper, 46 years of age, complained of "confusion and swimming of sight" (halos), much orbital and infra-orbital pain commencing towards evening and growing more severe as night advanced. Tension exalted; cornea *entirely insensitive* so as to permit of being touched by the finger; anterior chamber shallow; lens and vitreous clear except a greenish reflex not observed in case No. I. Fields for both form and color much circumscribed and almost entirely cut off on the nasal side. Vision: O. D. = $\frac{20}{160}$; O. S. = $\frac{20}{120}$. Early iridectomy was urged, but patient declined. Being an acquaintance of patient No. I, "whose eyes had been saved without an operation," he insisted that he should receive similar treatment. Vainly I urged that case No. I was quite exceptional and that such a happy and unlooked for denouement could not again be expected, and might have been purely accidental. But despite all he remained obdurate, preferring, as he said, "blindness to mutilation." I therefore undertook the treatment of his case, first divesting myself of all responsibility for whatever untoward issue that might follow his dogged rejection of proffered operative interference. Galvanism, as in case No. I, was employed, resulting at the first sitting in marked diminution of tension and relief of pain. Pilocarpin was instilled and patient directed to report daily. After nineteen additional galvanizations, patient was dismissed with vision in O. D. $\frac{20}{70}$, and in O. S. $\frac{20}{50}$. Correcting the refraction gave vision as follows:

O. D. + 1.75 Cyl. Ax. $15^{\circ} = \frac{20}{40}$.

O. S. + 1.37 Cyl. Ax. $105^{\circ} = \frac{20}{35}$.

This correction is still worn with comfort. Eleven months later patient reported no recurrence of glaucomatous symptoms. Both form and color fields showed great improvement. Nerve heads while slightly cupped beyond the physiologic condition showed no progressive tendency toward atrophy, the interior of the eye being otherwise healthy in appearance.

It is interesting and important to note that while there was much less cupping in case No. 2, and less limitation of vision, *there was also much less improvement in visual acuity, either with or without correction*, than was readily obtained in case No. I.

Case No. III. Young lady, 29 years of age. Had been a school-teacher for four years, and the last three years preceding

her visit to me, an accountant. She informed me that her eyes had been "troubling" her for several years, but she had refrained from consulting an oculist, fearing glasses would be prescribed. She was now ready to wear glasses, to obtain which was, as she frankly told me, the occasion of her present visit. A cursory examination revealed a widely dilated pupil in O. S. Ophthalmoscopic examination disclosed choking as well as cupping of the disc and a very pronounced greenish reflex. Cornea was anesthetic to a marked degree; anterior chamber very shallow; tension considerably increased, but less markedly so than in either of the two preceding cases. Pain was very severe only when and immediately after using the eyes. Halos of light were particularly annoying. Fields both contracted; vision $\frac{20}{100}$. Diagnosis: Mild attack of glaucoma simplex in O. S. Interior of O. D. was normal otherwise than as to refraction, being hyperopic 2.50 D. and astigmatic (hyperopic) 1.00 D., axis 110° . Iridectomy was not proposed to this patient. Recalling the two previous successful experiences with pilocarpin and galvanism and this being apparently a safer case in which to procrastinate because much less severe, I determined to again put the previous treatment to the test, hoping thus to determine whether its *apparent* success was coincidental or actually remedial. A mild current of galvanism was applied, but this time the poles were reversed, the cathode was placed at the nape of the neck, and the anode, covered with sponge, over the ball of the affected eye. The reversal of the poles was not made so much by design as through indifference. It was not apprehended as very material which pole was placed over the eye-ball. After a seance of five minutes my patient begged me to desist, declaring that the pain, which was slight at the beginning, had now become unendurable. Removing the sponge it was found that tension had risen about one-half, thus sustaining a tolerably close proportionate relationship to the increase in the degree of pain. Pilocarpin was instilled and an opiate prescribed, with instructions to call early the following day. Patient reported that on account of intense pain she had passed a sleepless night; that her vision was less good, and in every way was worse than when she first called on me. I now proposed iridectomy, but patient demurred, saying she had already been made much worse by what had been done the preceding day and "wished no more experiments tried" on her. Recalling that the galvanization of the day previous had been made with a reversal of the poles as employed in the first two cases, it was determined to make another attempt with the cathode this time over the ball of the affected eye. It required considerable persuasion to induce my patient to consent to another seance. Succeeding finally, however, in gaining her consent to submit to another trial, a very weak current was applied by placing the cathode over the closed lid, with the anode at the base of the occiput. I resolved to proceed tentatively and gradually increase the current if found to be well borne. Finding that the pain was not being increased, more current was applied

from time to time as the seance proceeded. At the end of twenty minutes my patient rose from her chair declaring that she felt "90 per cent better,"—that the pain was almost gone. The tension had certainly diminished also in about the same ratio. This method of treatment was continued daily for one week and every other day for the next three weeks; using, meantime, a weak solution of pilocarpin, at the end of which time tension was normal and had been so for a fortnight; cornea quite sensitive; anterior chamber fully re-established, and vision had risen from $\frac{20}{100}$ to $\frac{20}{50}$. Scarcely any cupping or congestion was perceptible at the disc. Form and color fields showed improvement. Patient was directed to report occasionally for examination and to refrain from using her eyes as much as possible for the next six months. At the end of one year the ophthalmoscopic appearance of the eye is quite normal; there has been no pain or increase of tension, and the field for both form and color (which in all of the three cases was the slowest to show improvement) was about normal. With the erroneous refraction corrected vision is a good $\frac{20}{20}$ in the previously affected eye.

It is to be observed that this young lady is much under the age at which we are supposed to expect glaucoma, and yet in most respects her case presented more of the typical or classical symptoms of the disease than either of the others, with the single exception of there having been less pain. Nevertheless, judging from external and internal appearances, visual and form fields, absence of pain, etc., the case may be said to have been absolutely cured, inasmuch as nothing commemorative of the original seizure now remains.

I have refrained from reporting these cases sooner because of a desire that at least a full year should elapse before doing so. It will be observed that in cases Nos. 1 and 2 considerably more than that time has already passed. I have notes of two other cases which promise equally satisfactory results, but sufficient time has not yet elapsed to warrant their being reported.

As was stated at the outset, it is not contended that these cases are *cured*, or, indeed, that glaucoma is ever cured in the sense in which that word is ordinarily employed and understood. All that is claimed is that these *were genuine cases of glaucoma*, such as would unhesitatingly be treated by iridectomy alone. The writer has witnessed scores of iridectomies done by the ablest of ophthalmic *diagnosticians* as well as surgeons where the glaucomatous symptoms were very much less marked, and in some instances where they were, indeed, quite obscure. Furthermore, it has been my undeviating custom to operate in all cases of high tension and anesthetic cornea, accompanied by pain and disturbance of vision,

without waiting for cupping of the discs or other symptoms which are usually considered typical indications of glaucoma. *Let it be understood, then, that there was absolutely no reason for not promptly operating in these cases except the positive refusal of the patients to have it done.* The employment of other expedients was greatly against the writer's judgment and advice, and had the patients been less obdurate, would not have been given a moment's consideration.

It is submitted, in this connection, that the results in these cases *without operative procedure were certainly as good as any ever obtained by it, and in case No. 3, better.* Certainly an iridectomy done under such circumstances and yielding the results indicated above might justly be regarded as highly and gratifyingly successful.

The only residuum of doubt may perhaps be best formulated interrogatively thus: *First.* Was the galvanic treatment, as indicated above, the potential curative factor, or was it the pilocarpin alone. *Second.* If neither, was it then purely coincidental? *Third.* If coincidental, will a certain percentage of glaucomatous cases always spontaneously recover without any treatment; or, if not *recover*, improve to such an extent and persist sufficiently long as to induce the *belief* that they are actually cured?

It is no part of the writer's present purpose to essay an answer to these queries or to dogmatize upon them. The results are submitted with the hope that the questions to which they seem naturally to give rise may receive that investigation at the hands of ophthalmologists that the gravity of the subject merits, for is not glaucoma and its treatment still the *bete noire* of ophthalmic medicine?

Remanding the above questions to future determination, a few considerations as to the probable curative action of galvanism may here appropriately find place. It must be conceded that the application of galvanism in each of the three cases above mentioned was followed by an *effect* which, as we have seen, was an immediate and continuing beneficial one. It is interesting and profitable to inquire *how*—in what manner—the galvanic current operated in thus producing amelioration of pain, reduction of tension, etc.? Was it through its action upon the nervous structure of the eye *per se*, or through a modification of neural nutritive processes by absorption of exudative products,—in short, was the electric action sedative or stimulative? In order to properly consider these points it is advisable to consider briefly some of the preva-

alent views as the pathology of glaucoma. I think the preponderating weight of authority is inclined to hold defective elimination (notably at the filtration angle) as the immediate causative factor in the production of the disease. Certainly the secondary effects of the disease are always found in intra-ocular pressure. Opinion may well divide as to whether this pressure is the result of some vice directed against the nerve supply of the eye so as to bring about a perversion of nutrition and, consequently, of function but which is still disconnected with and remote from the eye, or whether the origin of the trouble begins in the eye *per se*. Under the latter theory would be comprehended bad refraction errors with its resultant eye-strain,—in fact, anything likely to modify or pervert nutrition.

Priestly Smith, after a somewhat protracted study as to the immediate causes of increased ocular tension, states that he believes it may result from three conditions, viz: "Hypersecretion by the ciliary processes; serosity of the fluids, and obstruction at the filtration angle." In either or all of these conditions galvanism would seem to be indicated as the agent best calculated to modify and limit the morbid processes. That *practically* it has not always succeeded in accomplishing all that might reasonably be expected of it *may* be due somewhat to the unskilled and perfunctory manner in which it has been employed.

Von Gräfe believed increased secretion was the result of inflammation of the choroid, while Donders held that the increased secretion on the part of the choroid was due to an influence directed upon the ciliary nerves.

Both Weber and Knies hold that the ciliary processes swell up in consequence of venous stasis so as to press at their apices against the posterior surfaces of the iris. Displacing the marginal portion of the iris forward, it becomes adherent to the anterior portion of the sclera and margins of the cornea. The normal sinus of the anterior thus becomes obliterated. Attaching the iris to the ligamentum pectinatum closes one of the most important exits of the eye, *i. e.*, into Schlemm's canal—and it follows that an excess of fluid must remain in the eye. The desideratum, therefore, is to reopen the closed gateway.

Dr. Noyes, in his recently revised edition of "Diseases of the Eye," after carefully reviewing the different theories as to the causation of increased tension (which is really glaucoma), gives the weight of his opinion to the "retention theory," thus sharing the views of Knies¹ and Weber² first promulgated in 1876:

¹ *Von Graef's Archiv.* vol. XX., p. 3.

² *Von Graef's Archiv.* vol. XX., p. 1.

Priestly Smith, investigating along the same lines at a later date, found in eighty eyes affected with different varieties of glaucoma, obstruction at the filtration angle in all but three. He summarizes thus:

“The causes of primary glaucoma, then, are various and complex, and are not yet completely known, but they are alike in this—they all lead to compression of the angle. With that compression the actual glaucoma process begins. * * * The fluid which still exudes from the turgid ciliary body is albuminous and less diffusible than the normal secretion; it tends to accumulate behind the lens, and this latter, being pressed forward, intensifies the mischief. Thus cause and effect react upon each other in a vicious circle.”

It being substantially agreed, then, that whatever the initial cause, defective drainage at the filtration angle is the *immediate* cause of the pressure, it is important to inquire what is the pathologic change that occurs? Ophthalmic surgery has certainly indirectly recognized the existence of an obstruction or constriction somewhere in the region where Knies locates it (ligamentum pectinatum bound by exudation to the iris), by removing a part of the iris in their iridectomies. The desideratum would seem to be the removal of the constriction and liberation of the filtering function of the eye. *Now must that be secured by destructive agencies alone?* It was thought before the advent of the Apostoli method of absorption by the catalytic action of the galvanic current that fibroid tumors of the uterus could only be removed by the destructive agency of the knife. It is doubtful now if any gynecologist of repute would think of resorting to the use of the knife for the extirpation of uterine fibroids without first having made a thorough trial of the Apostoli method by galvanic absorption.

If the galvanic current is capable of causing absorption of a growth in the uterus many times larger than the human eye-ball, is it unreasonable to believe it capable of absorbing the adhesions or whatever the occluding substance may be that prevents the proper filtering of the ocular fluids at the iritic angle? If removing a piece of the iris surgically in order to afford room or another channel for the escape of the imprisoned ocular fluids is the most approved method of relieving intra-ocular pressure in glaucoma, why is it not quite as reasonable to attempt by catalysis the absorption of the occluding elements which have interfered with and perverted the natural course of drainage? Is not this precisely what we endeavor to accomplish every time we slit the canaliculus

and probe the lachrymal duct? The object sought is the restoration of physiological function, and to accomplish it usually two methods are presented: Restoration of function by changing the perverted to a healthy nutrition, or the destruction of the products of mal-nutrition by surgical processes.

With the galvanic current by its catalytic action we accomplish both results simultaneously. By its stimulating properties the current favorably modifies nutritive processes and at the same time causes the disappearance of mal-products by absorption. Therefore, while iridectomy meets the demand for more room, it neither modifies nutrition nor causes absorption of occluding substances. By iridectomy, physiological function is only re-established by removing a part of the iris, which is thus made to act vicariously, inasmuch as that is not claimed to be the primary offending or obstructing cause. Obviously if the view of those ophthalmologists who assert that the pathogenesis of glaucoma is interference with the nerve nutrition of the eye through either over or under stimulation be correct, it will be seen that iridectomy cannot theoretically promise as much in the way of relief and cure of the disease as galvanism.

Let me at this point quote from Liebig. Speaking of the "Vasomotor Effects" of the galvanic current he says:

" * * * It has been mentioned that the galvanic current produces variations in the caliber of the blood vessels at the points of the application of the electrodes. Similar modifications of the vascular caliber are produced by a stimulation of certain nerve centers."

Also, under "Trophic Effects," he says:

"Although our knowledge of a trophic system of nerves is still very indefinite, we may assume the existence of such nerves to aid us in explaining the phenomena of nutrition. Whether galvanism has any effect upon the trophic nerve is immaterial in the face of the fact that it undoubtedly has a decided influence upon nutrition. Atrophies of organs or tissues are often favorably modified by the galvanic current."

An iridectomy has only to do with the sequella of the glaucomatous attack by affording room for the re-establishment of physiological function. Manifestly it neither affects nor alters the neural impulse upon which the disease is believed by many to depend. Neither does it seek to regenerate the affected area by restoring the impaired function. Galvanism, on the other hand, is capable of meeting both these requirements, and that, too,

simultaneously. It is not necessary to dwell upon the catalytic quality of the galvanic current, because the absorption of exudates by this means has already become too well established in various branches of medicine to admit of serious argument. It would seem, therefore, that the better would be the more physiologic treatment, of attempting the absorption of the products of a glaucomatous attack rather than to pursue a roundabout and vicarious method, as is done in iridectomy, thus permitting the anatomical restoration of the affected parts so that normal physiological functions may become re-established and resumed.

But I may be told this does not cure the disease! Neither does iridectomy do so. By excision of a piece of the iris a new conduit for the escape of the imprisoned fluids at the filtration angle is provided, thus relieving occlusion, and by so doing making possible a reduction of intra-ocular tension. This, however, does not deal with the *cause*, but only with the *effects* of the disease. Restore the occluded area by absorbing the exudative products and tension must decline with the re-establishment of normal secretory processes. But here again we are dealing only with effects. The constant current, however, promises us theoretically not only as much as iridectomy, but a still better result, because its mission is that of repair instead of the partial obliteration of an unoffending part.

But when the *primary* cause of the disease is considered, the advantage of galvanism over iridectomy appears still more pre-eminent. Galvanism has been demonstrated to be capable of increasing or decreasing (depending entirely upon the mode of its application) nerve inhibition and, consequently, affecting the nutritive function of the part which it supplies. If the pathogenesis of glaucoma is a perversion of nervous energy, why not modify or discipline it with the expectation that by so doing the disease will be both arrested and its baneful effects removed *simultaneously*, the latter being attained through the catalytic quality of the current employed for accomplishing the former purpose?

In this connection, I quote entire the valuable diagram prepared by Dr. William J. Morton, of New York (to whom we are indebted for so many scientific and practical contributions in Electro-Therapeutics), and which is published in his brochure, entitled: "Upon a Possible Electric Polarity of Metabolism and its Relations to Electro-Therapeutics and Electro-Physiology," which will serve to better indicate the possible benefits of the constant current in respect to the subject under consideration.

All active centers of chemical exchanges (metabolism, health, disease) are electro-positive.	{	Metabolism, chemical exchanges over-active.	{	An applied + pole increases the activity; <i>i. e.</i> , augments the disease.
			{	An applied — pole decreases the activity; <i>i. e.</i> , cures the disease.
	{	Metabolism, chemical exchanges under-active.	{	An applied + pole increases the activity; <i>i. e.</i> , cures the disease.
			{	An applied — pole decreases the activity; <i>i. e.</i> , augments the disease.

Attention, in this connection, is invited to the fact that in case No. 3, hereinbefore cited, the anode was inadvertently or carelessly applied to the eye-ball, with the result of aggravating markedly the pain and causing an increase of tension, whereas reversing the poles secured, as in cases No. 1 and 2, an almost immediate diminution of pain and tension. This incident, if it is significant at all, would appear to be an important contribution to our present knowledge as to the pathology of glaucoma and indicates that in this disease we have to deal with a condition of over-activity of nerve function. By reference to the diagram of Dr. Morton it will be observed that in over-activity the cathode or negative pole is the proper one to apply to the orbit. As a matter of fact, it was that pole which was applied in the cases cited that subdued pain and reduced tension, whereas the application of the anode or positive pole markedly intensified the distress of patient No. 3 and accelerated tension. Whether this result was in obedience to a great but not yet well understood law or was a mere coincidence, I do not now presume to assert; but having put this data upon record, am content to await the developments of further investigation and fuller knowledge for its final determination.

No. 15 North Main Street.

IS THE PHYSIOGNOMY OF THE FUNDUS OCULI IN EPILEPSY CHARACTERISTIC?

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EVER since the employment of the ophthalmoscope as an objective aid in diagnosing cerebral and spinal disorders, the neurologic has been looking to the ophthalmic world for the description of those fundus pictures supposed to indicate certain conditions of the central nervous system. About none has there been more discussion than the ophthalmoscopic picture in epilepsy, perhaps because of the important place that disorder occupies in the category of nervous diseases.

Unfortunately, so wide has been the variance in results, that a prominent neurologist of Brooklyn* has recently stated that "until ophthalmologists can offer more definitely accepted positive results, we are warranted in ignoring the retinal appearances so far as the epilepsy is concerned."

The literature of the subject is vast; to illustrate the diversity of opinion a few authorities will be quoted:

Cross¹ in 95 cases finds no change in the majority of instances; when changes in circulation are noted, they are so various and widely dissimilar that no conclusions could be drawn. Allbutt², of England, has seen pallor of the optic discs, as has also Hughlings-Jackson³ and Alldridge.⁴

Hammond⁵ believes that the fundus of an epileptic eye is always congested or pale, and evidences cerebral plethora or anemia, and he sees a venous pulse in all cases of epilepsy with plethora.

*Dr. William Browning.

Teboldi⁶ has also recognized pallor of the papilla, increase in the venous circulation and immediately after an attack marked congestion of the veins with relative emptiness of the arteries. Gowers⁷, who is a high authority, states: "In idiopathic epilepsy the appearance of the fundus oculi between the paroxysms is as a rule normal. Some observers have described changes in the optic discs and increased vascularity, distended retinal vessels and the like. I have examined very carefully about 1000 epileptics and have found that in most cases every character of the fundus was *such as is presented by persons not epileptic*†. Now and then an unduly red disc is to be seen, but not more frequently than in non-epileptics, and in these cases it is explicable by the ocular conditions—a point too little attended to in medical ophthalmoscopy. The only deviation from the normal state of the fundus which has seemed to me frequent is an unusual equality in size of the retinal arteries and veins; the latter are not as a rule larger than normal, and the arteries appear as if large from a lax state of the vessel wall. Spontaneous pulsation in the veins has been described by Kostt and Neimetschek⁸ as especially frequent in epileptics; it is certainly not more frequent than in persons who are not epileptics."

Our last quotation will be from Oliver⁹. He concludes from his studies on epilepsy (at the State Hospital for the Insane at Norristown, extending over a period of seven years) that "the morbid process of cortex disease, as seen under the microscope, if long continued and if of any moment, can be recognized ante-mortem ophthalmoscopically in the optic nerve head and retina by similar relative changes of diseased action in these latter tissues." The changes in the optic nerve head and retina are "a low chronic form of retinitis and peri-vasculitis that is associated with a dirty (red-gray) incipient degeneration of the optic nerve."

Thus it will be seen that the testimony of observers is sadly conflicting.

Cross finds no change in the majority of cases. Gower's examinations of 1000 cases result in negative conclusions. On the other hand, Allbutt, Hughlings-Jackson, Aldridge, Tebaldi and Oliver find fundus alterations varying from a mere disturbance of the circulation to a low-grade neuro-retinitis.

A well-defined generally accepted conclusion as to the physiognomy and import of the epileptic fundus oculi is not yet possible. It can only be obtained by a summary of the results of

†Italics my own.

accurate observations carried on and recorded by various investigators.

It is with this conviction that the writer records his own experience, gleaned from one years' ophthalmoscopic study on epileptics at the State Hospital for the Insane at Norristown, Pa., during his residence at that institution. In this study the following precautions were observed.

1. Only selected cases of non-focal epilepsy were admitted to the study.

2. Subjects were chosen whose eyes were free from extraneous diseases. Inflammatory or traumatic eyes were omitted so as to obtain, as nearly as possible, representative peripheral organs.

3. Males were taken. These were chosen to avoid any conflicting findings that might be the result of special feminine characteristics.

4. No subject was examined within less than 24 hours after a convulsive seizure. These observations therefore belong to the interparoxysmal period of epilepsy and were intentionally made at that time, for it is during that period that the patient is generally seen by the practitioner.

5. All ophthalmoscopic observations were made under a mydriatic. This was done with particular reference to the macular region, the careful study of which is hardly feasible with a mobile iris.

6. Every subject was submitted to the same routine examination under the same conditions, thus obviating any seeming gross changes that might arise from differences in the method of study. As Oliver¹⁰ says: "The reasons for such rules are obvious, as by their observance all faults in working and want of precision in method are reduced to a minimum, and the conclusions, which are the very essence of the work, are thus rendered more valuable and less liable to gross and deceptive error."

Out of this study, conducted in the specified manner, grow the following observations:

First. In a number of cases the optic disc was superficially overcapillary, and in its deeper layers greyish and sometimes grey.

Second. In quite a number of instances the scleral ring was sharply cut, especially to the temporal side.

Third. In many instances the retinal lymph channels were distended and visible as glistening milky white opacities, occasionally along the vessels, but most frequently at the vessel entrance on the disc.

Fourth. In a goodly number of cases the fiber layer of the retina was seen much thickened, this condition being most pronounced superiorly and inferiorly.

Fifth. In a number of other instances the arteries were found a little wavy.

Sixth. In several instances the vessels on the optic disc surface were quite tortuous.

Seventh. In several cases the veins showed tortuosity.

Eighth. In a few instances pulsating veins were noticed.

Ninth. In a very few instances the macular arterial twigs were tortuous.

Tenth. In a few instances the chorioid in the macular region was granular. Particular notice was given to this last feature, as it was considered of some importance. Frequently it happened that conditions at first strongly suggestive of granular choroiditis disappeared under accurate focusing with the ophthalmoscope.

If we were to attempt now to draw a type picture of the background of the eye of an epileptic, it would be about as follows:

1. A superficially over-capillary optic disc showing greyness in its deeper portions.
2. A scleral ring, sharp cut temporally.
3. Increased thickness of the retinal fiber layer more marked at the superior and inferior margins of the nerve head.
4. Distension with opacity of the retinal lymph sheaths, more especially on the optic disc surface.

However, this group of ophthalmoscopic findings does not differ from that which the writer has frequently observed in low-grade neuro-retinitis consequent upon eye-strain. In this connection he wishes to remark that the great majority of epileptics included in the above study exhibited hyperopia or hyperopic astigmatism in amounts ranging from 1.00 to 4.00 diopters, the average being 1.47 D*.

A very few were practically emmetropic and a few more myopic in slight degree. It may be, as Gowers⁷ claims, that the neuro-retinal conditions of the epileptic fundus oculi are explicable by the ocular conditions. At any rate, in casting about for causative factors the ocular conditions are well worth weighing.

The author has no conclusions to offer. He feels that until the above study has been supplemented by extended work among epileptics he is not justified in putting forth positive statements.

* Measurements made under mydriatic with ophthalmoscope.

However, in concluding, he wishes to contend that in the present state of ophthalmic science, the claim that the background of the epileptic eye is the visible peripheral expression of correlated changes in the cerebral cortex, must be accepted with reservation.

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AN ARGUMENT FOR AMBLYOPIA EX-ANOPSIA IN CONVERGENT STRABISMUS.¹

BY W. FRANKLIN COLEMAN, M. D.,
OF CHICAGO.

GENTLEMEN: You will bear with me this evening in a departure from my tri-weekly clinical lectures, in presenting a didactic argument for the entity of amblyopia ex-anopsia and supporting it chiefly by citing the improvement in the vision of patients operated upon by myself for convergent squint. Whether you consider the amblyopia, usually present, to be a cause or a consequence of the deviation, is of great practical moment for your decision in regard to an early operation.

Among the supporters of the view that the amblyopia of squint is caused by disuse of the eye are Albert von Graefe, Donders, Leber, Stellwag, Wells, Juler, Theobald, Schmidt Rimpler, Berry, Fuchs, etc. Opposed to it are Schweigger, Wadsworth, Laudolt, Noyes, Roosa, de Schweinitz, Ulrich, Segger and others, who maintain the amblyopia is congenital.

Dr. A. F. Wadsworth, in an able paper in the *Boston Medical and Surgical Journal*, January 20, 1887, says: "The theory of amblyopia ex-anopsia was universally held until 1871, when Schweigger denied the amblyopia is so produced and asserted it to be a congenital defect." By 1876 Wadsworth was in agreement with Schweigger.

Having searched a fair amount of readily accessible literature, we will first present the arguments against the theory of amblyopia from disuse there produced, and next give the views in support of the theory, and give warning of our attempt to support the affirmative.

The claim of Noyes and Wadsworth that monocular congenital amblyopia is not rare is readily admitted, and that it is a very

¹Part of an evening lecture in the special course for January, 1895, at the Post Graduate Medical School of Chicago.

active factor in the causation of certain cases of squint is conceded. The question reduced to its simplest terms is: Does the more or less continued existence of a strabismus *per se*, induce an amblyopia?

Of prime importance for the solution of the question is a knowledge of the acuity of vision before the squint. Unfortunately this evidence is largely excluded on account of the early age (before 7) at which the deviation begins, and the meager opportunity for an early examination.

Schweigger asserts that no one has ever proved that an eye, which once saw well, has become amblyopic after the occurrence of squint. This would be a knock-out blow in the first round did it but strike with the force of fact. A few cases to the contrary (to be cited) will defend and more than arm his opponent.

Wadsworth "has never seen satisfactory evidence that vision of the squinting eye improved after operation;" and much to the same effect from Schweigger, Alfred V. Graefe and Noyes, who account for the "apparent" improvement by "incorrect examinations carelessly made," etc. The use of such weak material in the contest evinces a great lack of good ammunition.

This very denial of Wadsworth's in regard to vision is an admission that improvement would be evidence in favor of argamblyopia. Though Roosa contends that if such improvement occurs it is only a "post hoc." Opposed to this is the fact that if the amblyopia in squint is congenital it will remain permanent. The increase in vision is often too great to be set down to carelessness in testing, and, when it is moderate, why should not the early test be as well accredited as the post operative.

Schweigger states that in some cases of monocular squint of years' standing, vision in the squinting eye is as good as that in the other eye. Then, if vision is normal in the other eye, there is no amblyopia to account for. At most it is admitted as existing in "some cases" only, and goes to enforce the rule of low vision in a squinting eye. It is not an argument in favor of congenital amblyopia and may not be against amblyopia from disuse, for, possibly, in rare cases a high refractive error and weak externus of one eye may cause it to squint, though its vision may be somewhat greater at first than its fellow, and after the squint amblyopia may occur. Also, "a high degree of amblyopia in other recent cases," may be evidenced if the squint is extreme or a congenital amblyopia be present, and still not disprove the existence of an amblyopia from disuse.

Again, Schweigger asks, why do we have diplopia in paralytic and not in concomitant squint, and answers that, in the latter, retinal identity has not been established (an argument for congenital amblyopia).

We reply: The evidence for the establishment of "retinal identity" is manifest, inasmuch as diplopia *is* present in many cases of early squint, although it disappears later by habitual suppression of the excentric image and lowering of vision.

The deduction (by Schweigger) that the theory of suppression is invalid, because the image of a candle made to fall upon the macula of the squinting eye is seen, while the opposite eye sees an object it fixes, is sufficiently refuted by Theobald, who says the amount of suppression which is adequate to prevent the annoyance of double vision is less than that required for loss of light perception of a candle flame. But we cannot agree with Theobald when he states structural changes occur in the visual centers in time (during suppression) for that would preclude the increase in vision which takes place after operation for squint.

The experience of Schweigger and Wadsworth that in 30% of strabismus, vision is greater than $\frac{1}{7}$ is not unusual, yet it does not seem evidence against the exclusion theory. It rather demonstrates the great majority can by alternate fixation maintain relatively good vision.

The observation of Wadsworth that vision is very commonly as low as $\frac{14}{30}$ in non-squinting eyes needs no denial in this discussion. In refutation of the claim for a characteristic central amblyopia in squint, with good peripheral vision, Wadsworth is sure there is "partial central scotoma" in monocular congenital amblyopia. His view is not shared by observers in general, who describe a total defect of vision in such cases.

Noyes (2d ed., p. 182) refers to Schweigger's statistics thus: "This increase of the ratio of amblyopia, with the increase of the degree of the hyperopia in squint, points unerringly to the dependence of amblyopia upon congenital defect and not upon disuse." True, there is a congenital amblyopia associated with a high degree of (and proportionate to the) hyperopia in non-squinting eyes also. These two factors would be necessarily associated in strabismus and be added to the amblyopia of disuse. At least the statistics do not tend to disprove the latter view.

Wadsworth cites fifteen cases of monocular congenital amblyopia without squint. The very rarity of such instances, as com-

pared with the great frequency in squints of amblyopia, is very conclusive evidence that the latter is not congenital but acquired.

Next the affirmative side: A forcible paper, "Amblyopia of squinting eyes; is it a determining cause or a consequence of squint?" by Dr. Samuel Theobald, is found in *Trans. Amer. Oph. Soc.* 1886. He states the well-known characteristic of the amblyopia in squint which distinguishes it from that which is congenital. In the former the amblyopia belongs to the macula and the position of the false image, while vision is good in the periphery of the retina not concerned in the common field of vision. In the latter (congenital) the vision is never of the above character, the amblyopia is general and the fixation is central. Again: "If amblyopia is congenital the squint should come on early in life, but it usually appears when the child begins to read." Further: "The almost immediate restoration of binocular fixation after operation is against the theory of non-acquisition of retinal identity (and the correlated doctrine of congenital amblyopia) and in favor of the exclusion theory." With others, he maintains, the amblyopia is greater in long continued squint.

In opposition to amblyopia ex-anopsia, Noyes says the exclusive use of one eye does not in monocular cataract bring about amblyopia. While this holds good in senile cataract, in which the retina has once acquired its full function, it is not applicable to congenital cataract. Fuchs (p. 387) says: "If the cataract (congenital) is not operated upon (early) the development of the retina is arrested and amblyopia ex-anopsia is produced."

Finally we come to the argument for amblyopia ex-anopsia from the standpoint of improvement of vision after operation on convergent squint.

The following twenty-five cases are taken from Roosa's instructive report showing increase of vision after operation; stated in per cent by myself: 25% gain in one, 33% in one, 50% in ten, 100% in five, 300% in four, 400% in one, 700% in one, 1000% in one. In one, vision improved from light perception to $V=\frac{1}{16}$. Roosa reports 17 cases with same vision after operation as before and 31 in which with glasses and atropin it improved generally in one eye. And with this experience (*mirabile dictu!*) he adds: "These cases prove little for the theory of amblyopia ex-anopsia."

Roosa affords the following case, which refutes Schweigger's assertion that no case of normal vision before squint has been shown to acquire amblyopia after.

February 11, 1880, aet. 7 yrs. Periodical convergent strabismus.
 R., V. $\frac{20}{30}$; L., V. $\frac{20}{20}$. February 18, 1880, $\left. \begin{matrix} + \\ \text{At} \end{matrix} \right\}$ R. $+ \frac{1}{8}$ V.
 $= \frac{20}{20}$. L. $+ \frac{1}{8}$ V. $= \frac{20}{20}$. Wearing $\frac{1}{10}$. March 3, 1884.
 R., V. $= \frac{20}{100} + \frac{1}{10} = \frac{20}{100}$; L. $+ \frac{1}{10} = \frac{20}{20}$.

Roosa is forced to admit: "In this one case the lapse of four years does seem to have blunted the vision of the squinting eye.

Schmidt Rimpler relates as strong a case: "I operated on a boy of 7 years of age with severe strabismus convergens of the right eye. At the time of operation vision of the right eye was $\frac{20}{30}$ (H = $\frac{1}{40}$), but without binocular vision. Convergence of $1\frac{1}{2}$ mm. remained. Ten years later vision = fingers 4 m. (13 ft.) and fixation with inner part of the retina. There had been no disease of the eye in the meantime.

Knapp in 1863 had a patient whose vision increased from $\frac{1}{16}$ before to $\frac{1}{2}$ after operating.

Dr. Eugene Holt, *Trans. Amer. Oph. Soc.*, 1885, reports girl aet. 9. R. eye deviates in 35° and under all tests at two days' interval, totally and absolutely blind. Oph. exam. negative. One week after tenotomy and advancement V. = fingers at 50 cm. Eight days later V = $\frac{1}{24}$.

Harlan produces one instance of increase of vision from $\frac{20}{50}$ to $\frac{20}{200}$. The most convincing illustration I have seen of "amblyopia from suppression of the visual image" was furnished by Dr. W. B. Johnson at the twenty-ninth meeting of the Amer. Oph. Soc. T. McK. at 19. June 3, 1887. Cross-eyed since 3 years of age and unable during his recollection to see anything with his left squinting eye. R. V. $= \frac{20}{15}$; L. V. = fingers 6. Fundus normal. June 13th. Right eye lost from blow of hot file—enucleation. June 18th. V. L. E. = fingers 3". Instructed in locating letters and repeated later. July 1st. V. L. E. $= \frac{20}{15}$ and J. No. 1 at 12. Field normal. Three years later V. = $\frac{20}{15}$.

In the discussion, Noyes spoke of an equally remarkable case of Javal and gives this explanation: "The cerebral function is in suspense and loses conscious activity." This we are as willing to accept as to assume the amblyopia to be ocular. The former is as conclusive for acquired amblyopia of squint as the latter.

Dr. Risley: "I operated on one case in which the right eye was amblyopic. In four years vision was $\frac{6}{6}$; later the left eye could barely count fingers. Operated and prescribed glasses. In three months V = $\frac{6}{7}$.

The table on next page is made up of cases from my own practice taken in succession (without selection), which I carefully tested before and after operation.

TABLE SHOWING VISUAL ACUITY BEFORE AND AFTER

No.	AGE.	FORM AND DEGREE OF SQUINT	DURATION OF SQUINT	REFRACTION AND VISION
1	27 years	Monocular R=4'''	19 years	Acc. R. $+1\frac{1}{8} = \frac{15}{50}$ " L. $+1\frac{1}{8} = \frac{15}{50}$
2	17 years	Alternating L=3''' R=2'''	13 years	Acc. R. $+1\frac{1}{4} = \frac{15}{50}$ " L. $+1\frac{1}{8} = \frac{15}{50}$
3		Monocular Conv. R. E.=3'''	Since aet 2 yrs.	R. E. V. $=\frac{15}{50}$ Cannot read J. 20 L. E. V. $=\frac{15}{50}$
4	13 years	Alternating Conv.=3'''	Since aet 3 mos	Acc. R. E. $+1\frac{1}{8} V. = \frac{15}{50}$ " L. E. $+1\frac{1}{8} V. = \frac{15}{50}$
5		Alternating Conv.=2'''		Acc. R. E. $+1\frac{1}{2} V. = \frac{15}{50}$ " L. E. $+1\frac{1}{2} V. = \frac{15}{50}$
6	21 years	Alt. Conv.=2'''	Began at aet 8 mos	Acc. R. E. $+1\frac{1}{4} V. = \frac{15}{50}$ " L. E. $+1\frac{1}{4} V. = \frac{15}{50}$
7	16 years	Monoc. R=2'''	8½ yrs.	Acc. R. E. $+1\frac{1}{4} V. = \frac{15}{50}$ " L. E. $+1\frac{1}{4} V. = \frac{15}{50}$
8	10 years	Alt. R. or L.=3'''	Since aet 3 mos	Acc. R. E. $+1\frac{1}{8} V. = \frac{15}{50}$ " L. E. $+1\frac{1}{8} V. = \frac{15}{50}$
9	4 years	Alt. Conv.=3'''	3 years	R. E. V. $=\frac{15}{50}$ L. E. V. $=\frac{15}{50}$
10	13 years	Monoc. R.=2'''	11 years	R. E. $+1\frac{1}{8} V. = \frac{20}{50}$ L. E. $+1\frac{1}{8} V. = \frac{20}{50}$
11	10 years	Alt. usually R. E. Conv.=3'''	7 years	Acc. R. E. $+1\frac{1}{8} V. = \frac{20}{50}$ " L. E. $+1\frac{1}{8} V. = \frac{20}{50}$
12	14 years	Monoc. L.=2½'''	11 years	+ { R. E. $+1\frac{1}{4} + \frac{1}{8}$, 60 At { V. $=\frac{20}{50}$ L. E. $+1\frac{1}{8} V. = \frac{20}{50}$
13	27 years	Alt. R. E. Squinta more constantly =2½'''	16 years	R. E. V. = Quantitative light perception. Can not count fingers. L. E. $+1\frac{1}{2} V. = \frac{20}{50}$
14	13 years	Monoc. or R. E.=3'''	5 years	V. R. E. counting fingers at 18" on temporal side only L. E. $+1\frac{1}{8} V. = \frac{20}{50}$ + { R. E. V. = fingers 30" At { L. $+2.75 = \frac{20}{50}$
15	6 years	Monoc. L. E.=2'''	5 years	Acc. L. V. = fingers 4' + { R. $+4.00 = \frac{4}{12}$ At { L. E. V. = fingers 4'
16	14 years	Alt. Conv.=1½'''		+ { R. $+4.00 = \frac{4}{12}$ At { L. $+4.50 + 1.00 = \frac{4}{12}$
17	6 years	Alt. Conv.=2'''	Since aet 3 mos	+ { R. $+6.00 V. = \frac{4}{12}$ At { L. $+6.00 V. = \frac{4}{12}$

OPERATION UPON CONCOMITANT CONVERGENT STRABISMUS.

TREATMENT	TIME AND VISION AFTER OPERATION	REMARKS
Tenotomy R. and L. Int. Recti Spectacles	Eight months Acc. R. E. $+1\frac{1}{2}$ V. $=\frac{1}{6}$ L. E. $+1\frac{1}{2}$ V. $=\frac{1}{6}$	Central fixation possible with right eye.
Two operations on L. I. R. one on R. I. R.	In 17 months R. E. V. $=\frac{1}{30}$ L. E. V. $=\frac{1}{6}$	
Tenotomy both Internal Recti	Three months R. E. V. $=\frac{20}{100}=20$ J.	R. E. refuses any glass.
Tenotomy both Internal Recti and glasses	One year eight months R. E. V. $=\frac{1}{15}$ L. E. $=\frac{1}{25}$	Subject to fits in infancy. Sees double when she thinks of it. Homon. diplopia. Hyperphoria R. E. 4.
Operation L. I. Recti	One month R. E. $+1\frac{1}{2}$ V. $=\frac{1}{6}$ L. E. $+1\frac{1}{2}$ V. $=\frac{1}{6}$	
Operation R. and L. I. Recti	Three months R or L. E. $+2\frac{1}{4}=2\frac{5}{10}$	
Operation R. I. Rectus	Six days R. E. $+1\frac{1}{11}$ V. $=\frac{1}{8}$ L. E. $+1\frac{1}{11}$ V. $=\frac{1}{8}$	
Operation R. and L. I. Recti	Two weeks R. E. $+2\frac{1}{10}$ V. $=\frac{1}{8}$ L. E. $+1\frac{1}{4}$ V. $=\frac{1}{2}$	
Tenotomy R. and L. I. Recti	Five months R. E. V. $=\frac{1}{8}$ L. E. V. $=\frac{1}{2}$	
Operation R. and L. I. Recti and glasses	Fourteen months R. E. $+1\frac{1}{4}$ V. $=\frac{20}{100}$ L. E. $+1\frac{1}{4}$ V. $=\frac{20}{100}$	
Operation R. and L. I. Recti and glasses	Two years 10 months R. E. $+1\frac{1}{6}$ V. $=\frac{20}{100}$ L. E. $+2\frac{1}{2}$ V. $=\frac{30}{100}$	
Tenotomy L. I. Rectus	Five months R. E. c. glass V. $=\frac{20}{100}$ L. E. c. glass V. $=\frac{20}{100}$	Had worn comp. glasses three years before first consulta- tion.
Tenotomy R. I. Rectus	After operation V. R. E. $=$ fingers 1' One week after operation R. E. V. $=\frac{20}{100}$	Tenotomy R. and L. Int. Recti and advancement of R. E. Rectus one month after first operation. Five months later V. R. E. $=\frac{20}{100}$
Tenotomy R. I. Rectus and adv. R. E. Rectus, later tenotomy L. I. R. and adv. of Tenon's caps. over L. E. Rectus	Two years 9 months V. R. E. $=\frac{6}{5}$ V. L. E. $=\frac{4}{5}$	
Tenotomy L. I. R. and adv. of capsule over L. E. R. Sps.	Four months L. E. V. $=\frac{30}{100}$	Ophthal. examination R. disc. pale. Galv. to L. eye for six weeks; did not improve vision.
Operation R. I. R. and glasses, + 4.00	Ten months R. $=1\frac{1}{7}$ L. $=\frac{1}{8}$	
Operation R. and L. Int. Recti and Sps.	Two years 8 months R. E. $+6.00$ V. $=\frac{1}{8}$ L. E. $+6.00$ V. $=\frac{6}{8}$	

In eighteen eyes which showed subnormal vision on first examination, vision after operation remained the same in five, increased 25% in three, 50% in five, 100% in four, 300% in one. The great increase in vision in 13, 14 and 15 may allow special mention:

No. 13. Squint of sixteen years' duration. V. R. E. = Light perception. Cannot count fingers. L. E. + $\frac{1}{12}$ = $\frac{20}{20}$. After tenotomy R. E. the V = fingers 1'. One week later V = $\frac{6}{30}$.

No. 14. R. E. V. = fingers 18" (on temporal side only) under atropin = fingers 30". L. E. V. = $\frac{6}{9}$ $\frac{1}{2}$ glass. Tenotomy and advancement both eyes. Two years 8 mos. later V. R. E. = $\frac{6}{25}$.

No. 15. L. monoc. squint. V. = fingers 4' under atropin V. same. Tenotomy and glasses. In 4 mos. V. L. E. = $\frac{6}{30}$.

These three cases are too striking to be explained away by a charge of carelessness in the examination. In spite "of all temptation" to continue, the argument for amblyopia ex-anopsia and the reader (if he has toiled so far) may here rest.

36 Washington Street.

PURULENT INFLAMMATION OF THE EYEBALL AND
ORBITAL TISSUE, AND PARALYSIS OF THE
OCULAR MUSCLES AS POSSIBLE COM-
PLICATIONS OR SEQUELÆ OF
INFLUENZA.

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IN discussing the localized complications of any general systemic disease, and especially of any infectious disease, we should beware of regarding all that follows a disease as its direct effect. This is particularly true of the complex of symptoms which we call influenza, and the French "la grippe." Many of those attacked and weakened by influenza become, in consequence of this weakness, the victims of diseases which have no connection with the original cause of the weakness. The more closely we observe this disorder the more convinced we become that the sequelæ of influenza bear no relation to the severity of the primary disease. Another fact which has been made clear by the study and observations of cases of influenza is that the general number of eye diseases is not increased during the prevailing epidemic.

So far as we know there is no ocular complication or sequela of influenza which is at all characteristic of the disease. Affections of the eyes in influenza are relatively not infrequent. They are polymorphous, of multiple variety, and many of them slight in nature and easily relieved.

I think that it may be stated positively that no one specific infecting agent has been with certainty found in all cases of influenza. Among the bacteria found in the circulation, secretions or tissues of patients affected with influenza may be mentioned three varieties which are important from their consequences, viz: The diplococcus, streptococcus and staphylococcus pyogenes. All

these may induce embolic and thrombotic processes in any part of the body, and also give rise to true products which poison all the functions.

It scarcely seems necessary to call in question the credibility of the belief that purulent processes occurring in the eye are dependent upon the toxic products of influenza. The question, very naturally, however, arises: is the connection between the diseases of the eye and influenza direct or indirect, primary or secondary. Do toxic influences play the main rôle or do they merely lower the general health and thus pave the way for eye troubles?

The connection probably varies with different forms of eye disease. We start with the generally recognized assertion that influenza is an infectious disease in which capillary thrombosis have often been found. Emboli have been met with which are either infectious, or consist of simple clots. If they are infectious the streptococcus or the diplococcus or the staphylococcus pyogenes will be found. Many such cases have been reported in detail by the most careful observers, and there seems to be no reasonable doubt that purulent processes in the eye, the result in most cases of infectious embolism or thrombosis, are by no means infrequent complications or sequelæ of influenza. Of these the most important and the most disastrous in its consequences is the septic choroiditis or irido-choroiditis.

The most frequent purulent processes in the eye which accompany or follow influenza seem to be entirely external and are located in the lids, conjunctiva or cornea. In these cases Jaccourd has advanced the theory that the infection is intrinsic; that is, the numerous microbes of the conjunctiva, inoffensive when the patient is in good health, become noxious by the invasion of influenza. Fage, (*Archiv. d'ophtal.*, 1890, p. 316, et an deg), has reported cases of purulent dacryocystitis and abscess of the cornea with hypopyon. Landolt, (*Rec. d'Ophtal.*, 1890), has reported a case of abscess of the lid. Hosch, (*Correspondenzbl. f. Schweizer Aerzte*, 1890), reports a case of purulent irido-choroiditis with hypopyon. Eversbusch, (*Münch. Med. Woch.*, 1890), reports in detail an extremely interesting case of purulent choroiditis occurring on the ninth day of the influenza and ending in panophthalmitis and perforation. The staphylococcus pyogenes aureus was found in large numbers in the secretion, and infectious emboli were found in several of the blood vessels of the uveal tract. Fuchs, (*Wien. Kl. Woch.*, 1890), reports a case of purulent inflammation of the capsule of Tenon, beginning on the

fourth day of the influenza with exophthalmos, loss of motility, swollen lids, and eventually a discharge of pus by two openings into the orbital tissue, and the pus showed pneumococci. Gazis (*Rec. d'Ophtal.*, 1890) reports a similar case. Ehrlich (*Inaug. Diss. Berlin*, 1892) reports a case of abscess of Tenon's capsule, one of purulent orbital cellulitis, one of abscess of the lid, and one of purulent dacryocystitis. Laqueur (*Berl. Kl. Woch.*, 1890) describes a case of bilateral embolic iridocyclitis which came on suddenly on the eighth day of the disease and ended in complete blindness of both eyes which lasted four days. The patient subsequently regained a vision of one-half. Natauson (*Petersb. Med. Woch.*, 1890) reports a case of influenza with pleuro-pneumonia and bilateral embolic irido-choroiditis ending in total blindness on the third day, and death on the fifth day. Finally in the monograph by Leyden and Guttman on the influenza epidemic of 1889 and 1890, Horstmann, who wrote the chapter on affections of the eye, refers to cases by Pflueger, Greeff, Lyder, Borthem and himself, showing the great variety of suppurative processes in the eye met with in patients sick with influenza.

Among a number of cases of purulent diseases of the eye in patients suffering from influenza during the last three years which I have seen, the following recent case seems worth reporting in detail, on account of its severity and fatal termination.

On January 28, 1895, a woman, 40 years of age, was brought to me suffering from a very severe type of orbital cellulitis and panophthalmitis, and she gave the following history: The right eye had been blind for many years from a traumatism.

On January 23, she was attacked by many of the symptoms of influenza, coryza, obstinate cough, severe headache, high fever, pain in all her bones, and on the next day the eyelids began to swell and the eye to protrude. These symptoms rapidly grew worse, and when I saw her on the fifth day the eyelids were enormously swollen, the exophthalmos was extreme, the eyeball was very hard and immovable, and the pain was intense. Her temperature was $103\frac{2}{5}$; her cough was violent and the expectoration profuse. She was put to bed, hot bichlorid fomentations were applied, leeches to the temple were ordered, and phenacetin and morphia were given to take down her temperature and allay the pain. The applications were continued for three weeks before the signs of cellulitis and panophthalmitis entirely subsided. As soon as softening began, two incisions were made into the orbital tissue on both sides of the eyeball, and the pus then discharged freely.

The cornea had previously ruptured, and a large amount of detritus and pus was evacuated from the eyeball. After all signs of cellulitis had subsided and pus had ceased to be discharged from the orbital tissue, the eyeball was carefully enucleated, and a clean, apparently healthy cavity was left. On the evening of the second day after the enucleation, the wound appearing perfectly healthy, she began to develop symptoms of meningitis, and she died comatose on the fourth day. The autopsy showed purulent meningitis which involved not only the whole base of the brain, but also the entire convexity as well. The extensive character of the meningeal inflammation led me almost to suspect that the meningitis had begun before the enucleation was done. At the autopsy no pus was found anywhere in the sheath of the optic nerve, but a subsequent microscopic examination may give a different finding. There seems scarcely any doubt that this was an embolic process, whether starting in the cellular tissue of the orbit or in the uveal tract, it would seem impossible to say.

In regard to the affections of the nervous apparatus of the eye which are said to complicate or follow the influenza, including the muscles, the retina and the optic nerve, the cases reported by competent observers are even more numerous than the cases of suppurative disease, and their actual connection with the general disease cannot be denied. The most frequent of these nervous sequelæ is probably a paralysis of accommodation. Here the toxic agent of influenza resembles that of diphtheria. Then we meet, in the order of frequency, with paralysis of the sixth or abducens nerve; paralysis of the motor oculi or third nerve, and paralysis of the trochlearis or fourth nerve. The muscles supplied by the third, fourth or sixth nerves may be individually affected, or there may be complete external and internal ophthalmoplegia, either unilateral or bilateral. The paralysis of accommodation may occur alone without paralysis of the sphincter iridis, and in this peculiar effect the influenza resembles diphtheria. Three such instances have come under my own notice, and all regained the lost power of accommodation.

Schirmer (*Klin. Mon. f. Aug.*, 1890) reports a case of right unilateral complete ophthalmoplegia, coming on during the height of an attack of influenza. There was loss of sensibility on the right side of the face and scalp, with paresis of the right masseter and temporalis muscles, and also of the muscles of the tongue on the same side. As there was paralysis of the third, fourth, fifth, sixth and seventh nerves, the lesion must have been

central, and was possibly a hemorrhage at the base of the skull, in or near the middle fossa. It is a well-known fact that in many cases of influenza there is a strong tendency to hemorrhage in various regions of the body.

Affections of the retina and optic nerve have been found to be almost as frequent complications of influenza as are paralyses of the ocular muscles, but they seem to be divided into two classes: one which accompanies the attack of influenza, and another which is a pure sequela, coming on several weeks after the onset of the disease. It is more obstinate in resisting treatment and leaves more disastrous results as to vision than the first class, because there is not only inflammation of the sheath of the optic nerve, but also acute degeneration of the nerve fibers. The papillitis or retrobulbar neuritis met with during or after the attack of influenza resemble the same conditions met with in the course of other infectious diseases. Two interesting cases are reported by Landsberg (*Centralbl. f. prakt. Aug.*, 1890). The first was a man, who, on the fourteenth day of the influenza, suddenly lost the sight of his left eye, without any ophthalmoscopic evidence of disease. He could count fingers at two feet, had a very narrow field with total color-blindness, and regained his vision after eleven daily injections of pilocarpin. The other case was a woman who, during convalescence from influenza, had a sudden failure of vision of the left eye, with a central scotoma, proving the presence of a neuritis of the macular fibers, as the ophthalmoscopic examination was negative. She recovered under the administration of strychnia.

Ehrlich (*Inaug. Diss.*, Berlin, 1892) reports cases of retrobulbar neuritis and papillitis, and Antonelli (*Annali di Ottal.*, XXI, p. 119) the same. Snell (*Trans. Ophthal. Soc. United Kingdom*, 1892) describes cases of optic neuritis ending in atrophy. Hart-ridge (*idem*, 1892) reports a case of bilateral neuro-retinitis, and Métoxas (*Annales d'Oc.*, May, 1892) a case of retrobulbar neuritis, with hemeralopia, ending in atrophy.

Remak (*Centralbl. f. prakt. Aug.*, 1890) reports a case of a man, with a severe catarrhal form of influenza, who, on the fourth day had a series of four convulsions within one hour, followed by loss of vision and atrophy of the optic nerves.

Bergmeister reports cases of simple and inflammatory atrophy of the optic nerve, with concentric limitation of the field of vision and loss of the color sense.

Graddy (*Ophth. Rec.*, June, 1892) reports an interesting case of a woman who had a severe attack of influenza with pulmonary complications, and in the third week became suddenly blind, with a very small area of central vision for light. From this condition there was a slow improvement, followed again on the twelfth day by sudden failure of the vision, and right bilateral hemianopsia, which remained permanently.

Gifford (*Ophth. Rec.*, 1892) reports the case of a man who, during a severe attack of influenza, suddenly had an onset of violent pain in the occipital region, followed by bilateral right-sided hemianopsia. In each eye the line of demarcation followed the vertical meridian accurately and remained unchanged for nearly three years.

The writer has recently had under his care the following case: A gentleman, 62 years of age, a literary man, badly nourished, and a victim for many years to intestinal catarrh, on the fourth day of a severe attack of influenza, suddenly noticed an obscuration of the vision of the right eye. I saw him within a few hours of the occurrence, found a central scotoma, positive in character, with a diameter of about 30° in all directions from the center of the field. Within the limits of the scotoma vision was absolutely lost. The ophthalmoscopic examination was entirely negative and has remained so. The scotoma for form gradually grew smaller and eventually disappeared, but the sense for color is still absent within the limits of the original scotoma. There was no pain caused by movements of the eye in the orbit, but considerable pain was produced by pressing the eye backwards into the orbit. He recovered under the use of strychnia and pilocarpin administered hypodermatically. This was undoubtedly a case of retrobulbar neuritis, the fibers going to the region of the macula being involved.

AN ANOMALOUS CASE OF INTERSTITIAL
KERATITIS.BY ROBERT R. SAUNDERS, M. D.,
OF PHILADELPHIA.

THE patient, R. H., 19 years of age, presented himself to me for treatment August 13, 1894, complaining of "a cloud," as he called it, that had come over the sight of his left eye. He also complained of intense fronto-temporal headaches along with lassitude, diarrhea and feverishness. On closer inquiry I found that he had had diarrhea for about four days, and that he had been feeling badly for three or four weeks; his temperature when I first saw him was $102\frac{2}{5}$. In short, he had every symptom of typhoid fever. The cornea of the left eye was found to be densely infiltrated in the outer part of the lower and outer quadrant, and numerous infiltrated spots were found in its immediate neighborhood. There was not a sign of circumcorneal injection whatever, nor was there any throughout the history of the case. The vision in O. D. = $\frac{5}{8}$, O. S. = $\frac{5}{23.3}$. I told the patient that he had typhoid fever and directed him to go home and send for his physician, which he did. His physician confirmed my diagnosis and treated him. On September 17 I saw the patient again and found the vision in O. S. = fingers at 5 inches; the infiltration had shifted to the center of the cornea and the edges were clearing up rapidly. There was no circumcorneal injection. Saw the patient again October 1, and found the opacity lessening very much and vision improving. After this I lost sight of my patient, but heard that he subsequently had gotten some vision in the eye. There was no history of syphilis inherited or acquired and his teeth were not of the Hutchinson's type. Was it typhoid that caused the keratitis?

309 South Fifteenth Street.

FOREIGN BODY IN SCLERA FOR THIRTEEN YEARS.

BY FRANK W. RING, M. D.,
OF NEW YORK.

WE not infrequently hear of foreign bodies remaining in the eye ball for a much longer period, without causing any disturbance, but for one to remain in the sclera, without penetrating and its presence unknown to the patient is rather remarkable.

January 28, 1895, John Gallagher, 22 years of age, came to the Manhattan Eye and Ear Hospital with a foreign body protruding from the sub-conjunctival tissue, 10 *mm* from the cornea, temporal side, left eye. It was easily removed with the forceps, and found to be a *black thorn* 4 *mm*. in length and 1 *mm* at its base. The ophthalmoscope showed a perfectly normal interior with a vision of $\frac{7}{8}$.

History: Thirteen years ago, when a lad of 9, he was running through the bushes and this thorn pierced the sclera; the wound bled somewhat, but caused no particular inconvenience. It became imbedded in the sclera and was not visible. Five days ago closing of the lid gave him pain, and soon the thorn appeared base first through the tissue. It was rather remarkable that it should have been thirteen years working its way out.

101 Park avenue.

ABSTRACTS FROM FOREIGN OPHTHALMIC JOURNALS.

By CASEY A. WOOD, M. D.,
OF CHICAGO.

SALICYLATE OF SODIUM IN THE TREATMENT OF EXOPHTHALMIC GOITRE—THE PART PLAYED BY ASTIGMATISM IN THE CAUSATION OF CATARACT—PARESIS OF ACCOMODATION FOLLOWING DIPHTHERIA TREATED BY BEHRING'S "HEILSERUM"—SPONTANEOUS HEMORRHAGE (BLOODY TEARS) FROM THE CONJUNCTIVA—TATTOOING THE CORNEA FOR THE PURPOSE OF IMPROVING VISION—PARALYSIS OF BOTH EXTERNAL RECTI FOLLOWING DIPHTHERIA—A CASE OF "CHALKOSIS RETINÆ" (GOLDZIEHER).

The oculist may fairly lay claim to Basedow's disease as his own for the simple reason that he is the one frequently called upon to treat its most notable symptom. Unfortunately he is usually unable to do anything effective for his patient. Chibret¹ gives the following history of four cases in which he employed sodic salicylate with decided effect.

The first is that of an unmarried woman, 44 years of age, with the three classical symptoms well marked: exophthalmos, goitre and tachycardia. The salicylate was administered in doses of $1\frac{1}{4}$ gram four times a day, and at the end of four days there was a considerable amelioration of the symptoms. This improvement was maintained as long as the medication was kept up. Patient disappeared after five months.

A man, 42 years of age, with the same well known symptoms, was troubled so much with the rapid beatings of his heart that he could not sleep and was unable to make the slightest exertion. Even easy walking induced a state approaching asphyxia and brought on profuse perspiration. Five grams of sodic salicylate daily in divided doses gave him much relief in six days. While taking this treatment he was able to work in the fields, which he did for the space of a month. This result was particularly satis-

¹ Le salicylate de soude dans le goitre exophtalmique. *Revue générale d'ophtalmologie*, Jan., 1895, p. 1.

factory when we remember how grave a disease this is in so many instances.

The next case was carefully watched for two years. A woman, 38 years of age, had exophthalmos, rapid pulse, and slight goitre, with edema of the whole of the right side of the body. This was relieved by the salicylate after three days, and on further treatment the improvement continued. The trouble at first recurred when the medicine was stopped, but after a year's treatment the patient is beginning to get along without the salicylate; she now takes it only when, owing to an emotional attack, fatigue, cold, etc., she feels she may have a return of the trouble.

A woman, 40 years of age, applied for treatment in January, 1891. She had the usual signs of exophthalmic goitre. The salicylate of sodium relieved her almost immediately and as long as she continued to take it she did not suffer, although her surroundings were such as to favor a perpetuation of the disease.

The progress of Basedow's disease closely resembles that of gout. If the oculist carefully interrogates the patient and inquires into his family history he will nearly always find that the subject of exophthalmic goitre has had arthritic disease, either hereditary or acquired. This was the reason why the author tried sodic salicylate in these cases and he thinks there is no other gouty affection that so readily improves under this treatment.

The writer regrets that his experience has been confined to four cases, but thinks he might publish it, because to wait until he had seen a large number of examples of this rare disease would be to defer it indefinitely.

The remedy is a very unpopular one with the public. When taken without proper precautions its effects are often unpleasant. Chibret advises that the daily quantity be divided into four parts and given in at least half a liter of liquid. In this form it does not produce disagreeable effects even in cases of intolerance. If the patient refuses to take the full dose (5 grams), the daily amount may be reduced. Anyone can take without discomfort 2 grms. in the twenty-four hours.

THE RELATIONS OF ASTIGMATISM AND CATARACT.

Dr. Roure² thinks that in spite of numerous publications on this subject, the pathogenesis of cataract is still obscure. Aside from

² Du rôle de l'astigmatisme dans la genèse de la cataracte. *Archives d'ophtalmologie*, Jan., 1895, page 44.

such well known causes as traumatism, disease of the bulbar envelopes and such general diseases as diabetes, phosphaturia, atheroma, etc., not much is known about it. Vacher and Georges Martin have investigated the relations of cataract and astigmatism, but their results do not agree. While Vacher found astigmatism to be a common condition in the eyes of persons affected with cataract and believes that the anomaly has a marked effect in the production of the opacity in the lens, Martin does not so regard it.

The investigations pursued by the writer, in his attempt to throw further light on this subject, were made upon thirty-three cases of double cataract. No case was chosen where the astigmatism had resulted from injury or from surgical interference. The astigmatism was measured by the ophthalmometer. Among the conclusions arrived at were the following: (1) *That in twenty-five cases of double cataract, where both eyes were astigmatic, the eye with the higher degree of astigmatism was the first affected.* (2) *In five cases the lens of the eye having the lower degree of astigmatism first showed opacities.* Of the remaining eight cases there was no astigmatism or the anomaly was equal in each eye. (3) *In three of these cases the patient was not able to say which eye was first affected, i. e., the cataract probably appeared at the same time in each eye.*

It seems probable that the degree of the astigmatism exerts considerable influence over the time of life at which cataract appears. Thus it was found (4) *that the average age at which those eyes having from 0 to 0.50 D. of As. became cataractous was 62.4 years; from 0.75 to 1.50 D., 59.7 years, and from 1.75 to 2.75 D., 50.8 years.*

In spite of these figures Roure agrees with Martin that astigmatism cannot, *per se*, be regarded as a cause of cataract. In the sixty-six eyes examined, eleven, or 16.6%, showed no astigmatism. Martin's figures were 13.9% and Nordenson's 9.2%. (5) *Astigmatism cannot be regarded as a cause of cataract, but rather as a condition that favors its development when the unknown agent that produces the opacity is present.*

PARESIS OF ACCOMMODATION FOLLOWING DIPHThERIA TREATED BY BEHRING'S HEILSERUM.

The reporter³ furnishes histories of three cases of ciliary paresis treated by Behring's diphtheria "heilserum;" two of which were

³Schmidt-Rimpler. Accommodations-Paresen mit Behring'schem Diphtherie-Heilserum. *Centralblatt für prakt. Augenheilkunde*, Dec., 1904, p. 853.

probably the result of diphtheria while the third certainly was. The injections (a bottle of No. 1) were made beneath the skin of the chest with an ordinary hypodermic syringe and were not followed by any general symptoms. Whether the rather rapid disappearance of the accommodative paralysis in cases I and II was due to the remedy or not may be open to doubt, but it was certainly unusual. The improvement in speech also seemed remarkable. The writer thinks that further experiments will be required to determine its value in these cases. He thinks that it ought to be used in cases of conjunctival diphtheria, primary as well as secondary.

Case I. Boy, 9 years of age, had diphtheria the beginning of September and was fourteen days in bed. Had defect in speech and could not see well close at hand.

October 16. There was bilateral paresis of accommodation; H. 0.50, V. = $\frac{1}{8}$; papillary reaction normal; soft palate and uvula hang vertically. Patient chokes on drinking; speaks with a hoarse voice and cannot be easily understood. One injection of the serum.

October 18. Speech clearer; no choking during drinking.

October 20. Speech about normal. *The accommodative range widened until on October 29th it was normal.*

Case II. A boy, 10 years of age, had four weeks previously diphtheria and had been in bed until eight days before examination of his eyes.

October 20. *Strabismus concomitans oculi sinistr.* Right eye, H. = 2.5 D., V. = $\frac{1}{8}$; left eye, H. of 2.0 D., V. = $\frac{3}{8}$. Paresis of accommodation. Papillary reaction good. R. A. = 7.5. Fluids ejected through nose on attempting to drink. Uvula hangs to left. Speech rather hoarse. Injection of the Behring serum.

October 22. R. A. = 9.5. Uvula is now pretty straight. Speech the same.

October 24. Speech normal; no more choking.

October 29. A. = 12.5. Uvula very little out of the perpendicular.

Case III. Man, 24 years of age, seen on August 28.

October 14. He had hoarseness and dryness in his throat.

October 17. Some slight pain in the same place; increased on swallowing. He now began to suffer from pains in the stomach, and loss of appetite, could not take solid food and had to subsist on milk. Patient says he found he could not see well near by since he became ill and that he was unable to read ordinary print

since the 20th. The uvula was thickened, covered with a gray-brown exudation while the remaining parts of the pharynx were reddened and swollen. The examination showed, apart from this, nothing abnormal. The defect in vision is due to an accommodative paresis. A. = 3.5 D. In either eye there is 1. D. of H. which, when corrected, gives full visual acuity. In the beginning this patient was given general tonic treatment and a salt water gargle.

September 2. A subcutaneous injection of the heilserum.

September 9. A. = 5. D.

September 12. Amplitude of A. the same.

September 17. A. = 6. D.

September 20. A. = 7.5 D.

September 24. A. = 9. D. Discharged in good condition.

SPONTANEOUS HEMORRHAGE (BLOODY TEARS) FROM THE CONJUNCTIVA.

The writer⁴ gives an account of this rather rare symptom (shedding tears of blood) which has at various times been referred to in literature and as often attributed to causes entirely remote from the organ of vision.

His own case was as follows: A woman, about 50 years of age, came to him complaining that her left eye was frequently bathed in bloody tears. The eyes seemed to be normal and the bulbar conjunctiva was apparently healthy. But on everting the left upper lid there appeared at the upper and outer margin of the tarsus a small sessile tumor $2\frac{1}{2}$ mm. long by $1\frac{1}{2}$ mm. wide. Touched with a probe it immediately began to bleed profusely. The patient then told how on awakening she sometimes found her face and ear smeared with blood.

Compression did not stop the bleeding so the whole tumor was destroyed by the galvano-cautery. The writer quotes Galezowski as saying that Forestier, Havers and Hassner have reported cases, but that they are very rare. The last named author speaks of an example in a woman suffering from irregular menstruation. According to him the bleeding was vicarious and occurred by transudation into the glandular vesicles. Galezowski has always found in such cases small subconjunctival abscesses or cysts whose mucous surfaces were rough, irregular and easily made to bleed. He advises that the palpebral conjunctiva and the retro-tarsal folds be carefully examined in all such cases.

⁴F. Matthieu. Pseudo-hémorrhagie spontanée de la conjunctivie. *Recueil d'ophtalmologie*, Jan., 1895.

In the instance under discussion the tumor seemed to be a papilloma which had undergone an angiomatous transformation. This was all the more likely as there were some five or six warty growths in the palpebral neighborhood—a coincidence commonly observed in papilloma conjunctivæ.

TATTOOING THE CORNEA FOR THE PURPOSE OF IMPROVING VISION.

Tattooing the cornea⁵ as a means of improving the vision although not a new procedure might, with signal advantage, be used more frequently than it is. In other words, the ophthalmic surgeon may, to advantage, imitate the "pin hole" obturator by a skillful use of the method.

Among the cases where this has been carried out with success is the following by Landau: A man, 28 years of age, came to him on account of defective vision in his right eye, that had suffered two months before from a tedious and very severe inflammatory attack. The eye was then quiet and free from signs of congestion, but there was a large white rectangular opacity with irregular cloudy edges covering fully the lower three-fourths of the pupillary area and reaching to the limbus cornea. Towards the temporal border there were slight anterior synechiæ. V. = $\frac{1}{20}$; with + 6. D., Sn. $3\frac{1}{2}$ was read at four inches. Tension and F. of V. normal. Patient was advised to have an iridectomy performed after the cornea had been tattooed.

October 9. The whole scar was well blackened in one sitting, care being taken to avoid the incarcerated iris. Four days afterwards the cornea had healed, was smooth, black and shiny.

October 30. Distant vision had improved to $\frac{1}{8}$ or $\frac{1}{10}$ and Sn. $1\frac{1}{2}$ was easily read at six to seven inches. This remarkable improvement in vision by simply tattooing the cornea made the propriety of an iridectomy at least doubtful.

The tattooing was carried out after the plan of Liebrecht, the needle being carried *obliquely under the surface of the scar*, and the coloring matter allowed to flow into the opening; or the same purpose accomplished with a small hypodermic syringe. Thus in one sitting even a large scar can be successfully colored, the limits of the tattooing regulated, and the cloudy edge of the cicatrix sufficiently blackened. Hirschberg has always taught that when

⁵ Otto Landau. Hornhautfärbung zur Verbesserung der Sehschärfe *Centralb. für pht. Augenheilkunde*, Jan., 1895, p. 10.

only a very small portion of the natural pupil is unaffected by a scar better vision can be obtained by judicious tattooing than by iridectomy.

PARALYSIS OF BOTH EXTERNAL RECTI FOLLOWING DIPHTHERIA.

Heintz⁶ presents the following interesting and rare example of post-diphtheritic paralysis of both external recti without any accompanying affection of accommodation. It resembles very closely a somewhat similar case reported by Harry Friedenwald in the *Medical News* for October, 1893. A boy, 7 years of age, was perfectly healthy until the end of September, 1893, when he contracted diphtheria which affected the post-nasal space. About three weeks afterwards the parents consulted a specialist on account of difficulty of swallowing and nasal intonation in speaking. This was accompanied by a marked paresis of the palatal muscles. All these symptoms improved under treatment so that by the end of October he was able to go to school.

November 6. The patient suddenly began to complain of his eyes, especially of double vision and dizziness, while his parents and teacher noticed that he had begun to squint.

November 10. The author examined him and found both eyes emmetropic with normal V. for both distance and near. The pupillary reaction was normal. There was alternating convergent strabismus, *i. e.*, in looking to the right, fixation was accomplished with the left eye; in looking to the left, with the right eye. In looking straight forward at an object 8 *m.* distant there was *homonymous* diplopia, the images standing well apart.

Nothing but hygienic measures were employed in the case.

November 20. There were no traces of the squint, and double images were seen only when the patient looked to the extreme right or left. He was able to resume his school work and even to read without difficulty. The latent convergence for the near (30 *cm.*) measured 2°, for the distance 6°; right the same as left.

November 29. Latent convergence for near and distance was 2° and 5°. Looking to the extreme right developed a homonymous diplopia at 8 *m.*, but there were no double images toward the extreme left.

February 28. Adduction was 44°, abduction 6°, diplopia only when patient looked towards the extreme right.

⁶E. Heintz. Ueber einen Fall von doppelseitiger Abducens-parese nach Diphtherie ohne weitere Augenstörung. *Centralblatt für prakt. Augenheilkunde*, February, 1895, p. 33.

It is highly probable that this is a case of diphtheritic paresis of both externi without implication of the ciliary muscle. It is unlikely that the accommodation could have been affected early and then recovered before an examination had been made of his eyes because the boy had, while in school and previous to seeing the oculist, been noticed to hold his book nearer to his eyes than usual.

A CASE OF CHALKOSIS RETINÆ (GOLDZIEHER).

The writer⁷ is impelled to report this case by the discussion at the last meeting of the International Ophthalmological Congress of Leber's paper on injuries to the eye from pieces of copper. A man, 18 years of age, had for ten years a piece of copper imbedded in the retina. It can now be made out by proper illumination even without the ophthalmoscope. The writer once more carefully examined the patient before reporting the case and believes that the description about to be given is absolutely correct, and that little or no change has taken place in the fundus appearance for almost a year at least.

The left eye is somewhat myopic, but has full visual acuity and is otherwise healthy. The right eye has a disc-like and very faint cloudiness of the anterior lenticular capsule, covering the pupillary area. A little to the temporal side of this there is another smaller opacity situated in the anterior layer of the lens substance. Cornea and iris are normal and there is no trace of posterior synechiæ. On dilating the pupil, if the examiner looks into the eye when it is well illuminated he will see from the depths of the fundus a well marked metallic, red reflex. The lens is perfectly transparent except at the points above mentioned. In the vitreous are several punctiform as well as a number of large floating opacities, but all the details of the fundus can be readily made out. The papilla and retinal vessels are normal. Beginning about half a disc diameter from the temporal margin of the nerve-head and including the macular region is a number of remarkable lesions. The retina in the space indicated is filled with innumerable glistening spots or stipplings, of a bright orange or red color. These are joined to one another by small lines. They resemble, in the words of the writer, the microscopic network of

⁷Ueber den Fall eines seit 10 Jahren in der Netzhaut verweilenden Kupfersplitters, nebst Bemerkungen über Imprägnation der Netzhaut mit Kupfer (Chalkosis retinæ). *Centralblatt für opt. Augenheilkunde*, Jan., 1895, p. 1.

cells which is brought out when the cornea is stained with nitrate of silver. These plaques lie in the anterior layers of the retina under the large superficial vessels, which latter appear to be entirely normal. They show no trace of pigment cells and are evidently not connected with the choroid. About the region where the macula lutea should be, and evidently penetrating the ocular coats in a slanting direction, is a thin, long body with its end raised above the plane of the retina. On moving the head or mirror to and fro this object and the surrounding retina give a visual sensation exactly like metallic luster.

The patient gives a history of having been exposed ten years before to the explosion of a percussion cap which had wounded him in the eye, and that he was treated for it for some time. Strange to say, in the injured eye V. = $\frac{3}{8}$, almost; there is M. of 2. D. and the patient can read small text.

It is probable that the thin piece of copper entered the cornea in such a way as to leave no trace and penetrated to the macular region, causing the minimum amount of injury. That copper fragments may remain in the eye for many years without producing any irritation is well established. That this is due to the fact of their being aseptic is also well known. The remarkable change produced by the fragment under consideration is probably chiefly a chemical one—the impregnation of the surrounding retina with some form of copper, probably with the oxide. It is possible, also that the visual purple might enter into such a compound. Whatever be the exact nature of the glistening metallic compound thus formed in the retina the writer proposes for it the name *chalkosis retinae*.

ABSTRACTS FROM CURRENT AMERICAN AND ENGLISH OPHTHALMIC LITERATURE.

BY CHARLES H. MAY, M. D.,
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HINTS CONCERNING THE PERFORMANCE OF THE OPERATION FOR THE EXTRACTION OF SENILE CATARACT, BEING A RECORD OF PERSONAL EXPERIENCE.

Hasket Derby, M. D., Boston (*The Boston Medical and Surgical Journal*, January 31, 1895.) Dr. Hasket Derby was led to present this record of his personal experience by the appearance of Dr. Hermann Pagenstecher's recent excellent and instructive article entitled "Practical Advice to Young Ophthalmic Surgeons in regard to the Operation for Cataract" (*Monatsbl. f. Augenheilk*, November, 1894). The paper embodies the convictions of thirty years of practical experience. The following are some of the most important paragraphs:

"It is my intention to discuss the best manner of restoring useful vision to the subjects of senile cataract. Confining, then, our study to this class of cases, I start with two axioms. The first, that no operation is to be done on one eye as long as the lens of the other is wholly transparent; the second, that, save in most exceptional cases, entire maturity is to be awaited."

"In regard to maturity, much is said at the present day concerning the possibility of the extraction of the lens, particularly in the case of aged people, in almost any state of opacity; nay, the removal of the transparent crystalline is seriously proposed as a remedy for extreme myopia. My own experience leads me to believe that the absence of perfect ripeness invariably diminishes the chances of success, in many cases complicates convalescence, and always renders the satisfactory performance of the operation more difficult. Of course there are occasions on which, of two evils, the lesser must be preferred, and times when it is better to encounter the risk of removing a cataract that is not wholly ripe than to leave an aged patient, who has wholly lost the power of reading and writing, to the depressing effect of forced idleness."

"The matter of prognosis is one on which the surgeon is invariably approached, one of the first questions put by the patient or his friends being as to the chances of success. It may safely be stated that, in an uncomplicated case of mature senile cataract occurring in a reasonably healthy patient under or not much past 85, when the cornea is fairly large, the pupil readily dilatable and the conjunctiva as well as the lachrymal apparatus free from disease, the chances of regaining useful vision are at least 85 per cent, while those of total loss of the eye may be estimated at 2 per cent. Where the above conditions are fulfilled this certainly agrees with my own experience. We operate, however, in many instances where they are not, and no law as to the effect of complications on an ultimate success can be formulated."

"*Shall iridectomy be performed or not?* This is the burning question of the present day. In favor of leaving the iris intact may be mentioned the lessened operative interference with the eye, there being but one wound to heal instead of two, the cosmetic effect of a round central pupil, and the protection afforded by its spontaneous dilatation and contraction. Against simple extraction are to be alleged the increased difficulty in removing cortical substance that may remain behind from the pupillary area, and the great danger of prolapse of the iris. And, in consideration of this, I see no reason for departing from the belief I have always entertained that the average patient at the hands of the average surgeon stands a better chance of an uncomplicated recovery, and in consequence thereof of attaining useful vision, if iridectomy be performed. It is true that great and practiced operators obtain excellent results in the vast majority of cases from simple extraction, and that many of them at this time are inclined to make it the rule and the combined operation the exception. But even they must accept the fact that no amount of experience in selecting cases, or of manual dexterity in operating, can enable the surgeon to declare that in any given case iris-prolapse may not occur. In a series of a hundred attempted simple extractions it will be found that six or eight iridectomies have to be done after the removal of the lens, on account of the difficulty experienced in maintaining reposition of the iris. And the performance of iridectomy at this stage is always a delicate and most difficult proceeding. And in from eight to ten other cases, out of the same hundred, iris-prolapse takes place under the bandage, owing to some sudden motion of the patient or without assignable cause."

"If this is the experience of the older surgeons, what might be that of the beginner? I maintain, therefore, that the young practitioner will do well to combine iridectomy with extraction."

"The cut is made at the sclero-corneal junction and should extend over one-third of the periphery of the cornea, being crescentic in shape. Pagenstecher, whose view as to the cut I have here reproduced, advocates the formation of a conjunctival flap, from which I wholly dissent. He has already dwelt on the advantage of eliminating a second wound in the shape of an iridectomy, and yet he now advises the infliction of one much larger and more external, involving a relatively large healing area. It has ever been my practice, on completing the corneal cut, to turn the blade of the knife forward and cut out as rapidly as possible, fixation being at once and finally desisted from."

"The capsule is to be thoroughly incised in different directions with the cyctotome. I see no advantage in the peripheric opening advised by some writers."

"The irrigation of the anterior chamber for cleansing purposes is a difficult and delicate proceeding, and, although in the hands of experienced operators it may sometimes be productive of good results, it is never to be advised the beginner, who had better run the risk of allowing a small amount of lens matter to absorb than follow a method the results of which are sometimes so harmful."

"Should vitreous escape before the lens is removed, and especially if the latter shows a tendency to become dislocated backward or downward, the scoop (preferably that of Bowman) should be at once introduced and the lens extracted. As this is a contingency that may at any time occur, it is well to have the scoop in readiness and thoroughly disinfected before commencing the operation."

"After the removal of the lens and the clearing of the pupil, the rubber spatula is to be passed into each corner of the wound to free any fragment of iris or capsule that may have lodged there. A drop of a 1 per cent solution of eserine instilled into the conjunctival sac before closing the eye tends to withdraw the iris from the wound and thus prevents prolapse. A sterilized bandage is then to be applied."

"I always endeavor to operate in the early morning; it is my custom to visit the patient again late in the afternoon and change the bandage, washing the outside of the eye with sterilized cotton dipped in sterilized water, but not separating the lids. This is repeated hereafter once a day until the eighth day, when I make my first examination of the eyeball."

"Of course, the rule is not invariable; there are cases where the skin will not so long support the irritation of continued pressure and requires earlier exposure to the air. And where pain, swelling, lachrymation and discharge warn us that the normal healing process is not going on, an immediate examination must be made."

"In order to secure dilatation of the pupil I frequently wet with the usual solution of atropin the small piece of linen that is placed directly on the eye and serves to prevent fragments of lint from getting in between the lids. This is done daily for several days previous to opening the eye, and is found in the majority of cases to affect the pupil. It is especially desirable to do this in cases where cortical substance is known to have been left behind."

"In regard to the claim that after the operation of extraction only one eye need be guarded, the lids being lightly closed with plaster; that the patient may be allowed to remain in a light room, and even to use the other eye, it may be replied that undoubtedly some eyes recover under these or even more unfavorable conditions, and that accurate and extended statistics must be substituted for vague assertion before the average surgeon will be justified in so serious a departure from precautions which have stood the test of long experience."

"I seldom find it necessary to confine the patient to the bed more than twenty-four hours. On the afternoon of the operation a bed-rest may be used under the shoulders and a half-sitting position indulged in, a change always productive of much relief. After dressing the eye the following morning the patient is allowed to leave the bed and occupy an easy chair, wearing a loose wrapper. On the third day the ordinary clothing may be resumed and a walk up and down the entry allowed, an attendant being of course at hand. A mild form of mania that occurs with some old people a few days after the operation is largely due to the combined effect of darkness and solitude."

"Such an article as the present might be almost indefinitely prolonged. It is a record of personal experience and is to be taken for what it is worth. I have seen flap extraction with the triangular knife, the operation generally practiced during my student days, modified later by previous iridectomy, entirely superseded by the methods of Graefe, this in its turn reinforced by anesthesia and asepsis, as well as changed in various details. In the face of such mutation, occurring during the life of a single individual, it is not improbable that we are on the threshold of even greater changes, and that the teachings given in the present article will before long offer a simply historical interest."

REMOVAL OF THE LENS FOR HIGH MYOPIA.

Mr. C. Wray, (*Medical Press*, February 13, 1895). Report of the meeting of the Ophthalmological Society of the United Kingdom, January 31, 1895. Mr. Wray considered it settled that the removal of the lens for myopia of high degree was not applicable in children with less than 10 D. or in adults with less than 12 D. myopia. The objects of the operation were: (1) To prevent detachment of retina, (2) to arrest or prevent retino-chorioidal changes, and (3) to enable patients with the highest grades of myopia to work at reading distances if unable to do so. He had collected statistics of 123 patients with 246 eyes. In 38 cases, including 3 of detached retina, the patients had vision less than $\frac{3}{8}$ in one eye, while 10 had vision less than $\frac{3}{8}$ in both eyes. These figures admitted of three deductions: (1) That vision is invariably less in the fourth decade than in the third; (2) that the retinal detachment was less to be feared than the changes in the chorioid and retina, and (3) that it was not necessary to regard every myope of 12 D. and upward as hopelessly drifting towards detachment of the retina and blindness. He had seen a case of retinal detachment after the removal of a lens in a case of myopia of 30 D., and he considered that detachment was comparatively frequent after the operation. In Parinaud's case the removal of the lens was not followed by prevention of the myopia, and he considered the operation a success if it prevented progressive changes in the fundus, and enabled patients to work at reading distance when unable to do so before with glasses. In myopia of low degree associated with zonular cataract the crescent was at times out of all proportion to the amount of myopia, and he presumed that this was due to amblyopia, and on that conviction it was a common thing to remove zonulars when patients could see $\frac{1}{4}$ and J. 4. It was a matter for regret that the hospital reports did not give the subsequent history of these cases. He pointed out that myopes of over 10 D. very seldom saw more than $\frac{1}{8}$, and in the fourth decade $\frac{1}{4}$. This raised the question, should the amblyopia be regarded as a reason for operation, seeing that some of the results of foreign observers had been extremely brilliant although the results on the whole varied widely as in other cases of extraction of the lens. The only case that appeared to bear on the prevention of changes in the chorioid and retina was Meyer's, in which, after removal of a lamellar cataract from a myope, the fundus changes were said to have progressed, and judging from the statistics at his disposal, more rapidly than they

would in all probability have done in the natural course of events. There was unanimity on the point that the patients were able to work much better after the operation, and some were enabled to follow vocations which had previously been impossible. If, however, as appeared to be the case, vision was practically sure to get worse, it would seem wise not to wait until the nutrition of the macula had been seriously impaired. Floating opacities in the vitreous, especially if in any number, would probably negative operation and diminished tension would certainly do so.

In reply to the discussion of his paper, Mr. Wray said that if patients have been using their eyes much and showed large crescents, the longer one postponed the operation the riskier it became. He admitted that the operation involved the removal of immature cataracts at a period when they were most dangerous. The results related that evening were scarcely in harmony with those recorded by foreign observers, but he thought they were bound to accept their results. The broad fact remained that in a large number of patients operated upon, sight was improved to $\frac{1}{12}$, and this improvement continued for a considerable time, nevertheless, the frequency with which detachment of the retina followed was calculated to make one pause. His object in bringing the subject forward was to elicit an expression of opinion as to its advisability, and the balance of opinion seemed to be against it.

A SUGGESTION AS TO THE TREATMENT OF PENETRATING WOUNDS OF THE CILIARY REGION AND LENS.

Robert L. Randolph, M. D., Baltimore, (*New York Medical Journal*, February 23, 1895). After speaking of the nature and dangers connected with penetrating wounds of the ciliary region and lens, the writer recites the histories of three cases with remarks, pointing out (1) the peculiar danger attending these wounds; (2) the necessity for adopting radical measures at once in dealing with these cases, and (3) the fact that the crystalline lens often acts as a foreign body and its presence rendered the condition of the eye more dangerous. His conclusions are:

1. In penetrating wounds of the ciliary region and lens, even when light perception is gone, and where usually enucleation is performed, the removal of the lens will often be followed by the recovery of comparatively useful vision.

2. The time to perform the extraction is in the first week of the injury, when there is less reason for entertaining the fear of

sympathetic ophthalmia, and that sympathetic disease is too remote a contingency in any event, and certainly at this stage, to outweigh every other consideration.

3. The effect of the operation is to remove what is really a foreign body, and at the same time it frees the ciliary region of its infectious contents—very much the effect of opening an abscess.

4. Cleanliness is imperative in this operation. I usually sterilize my instruments in a 2 per cent solution of bicarbonate of sodium, and keep the field of operation constantly irrigated with a 2 per cent solution of boric acid. Any solutions that irritate—such, for instance, as sublimate solutions—are to be avoided, as they weaken the resisting powers of the eye. The after treatment consists in the instillation of atropin, 1 per cent, every four hours, and the wearing of a compress bandage.

5. Improvement in these cases, as would be expected, is rapid, and unless it is rapid, one should not delay in enucleation.

THE PREVENTION AND TREATMENT OF OPHTHALMIA NEONATORUM, AND THE NECESSITY FOR MORE EFFICIENT LEGISLATION TO PREVENT BLINDNESS FROM THIS CAUSE.¹

BY CHARLES H. MAY, M. D.,
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IT is the purpose of the author's paper to prove that, although legislation to prevent the occurrence of blindness from ophthalmia neonatorum was effected in New York State in September, 1890, it has not been successful in materially reducing the disastrous effects of this disease; secondly, he suggests a modification of the law which will, if enforced, be more certain to diminish the number of cases, or at least make it exceptional for blindness in one or both eyes to result.

After reviewing the methods of prophylaxis and treatment and pointing out the brilliant results which may be expected when these are properly carried out, he gives statistics from various eye-clinics in New York City showing the number of cases of ophthalmia neonatorum treated for each year for the past six years.

¹ *Medical Record*, Feb. 16, 1895.

One point which he brings out in connection with the treatment of corneal complications of ophthalmia neonatorum is of especial interest. He says:

"There is a general tendency, even among oculists, not to make direct applications upon ulcers of the cornea occurring in the course of this disease; while this holds good for very extensive ulceration or sloughing, circumscribed ulcers can be advantageously treated by touching them from time to time with tincture of iodine, or even the actual cautery, especially if the inflammation of the lids has subsided. Recently I have seen a number of cases do well under cauterization, and there seems to be no reason at all why such ulcers should not be treated and prevented from spreading, exactly in the same manner as in the case of other infected ulcers. In the course of time, corneæ which seem hopelessly involved, sometimes clear up to an extent which permits some vision,"

The following are the totals arrived at by his statistics:

Table showing the number of cases of ophthalmic neonatorum treated at the various eye clinics of New York City, from 1888 to 1894.

TOTAL OF FOUR INSTITUTIONS.

YEAR	Total number of eye cases	Number of cases of ophthalmia neonatorum	Cases per 1000 eye-patients
8 years. 1888..... 1889..... 1890.....	} 76,366	452	5.92
8 years. 1891..... 1892..... 1893.....	} 97,493	488	5.0

"A glance at the results given by this table shows that among 76,366 cases for the three years, 1888, 1889 and 1890, there were 452 cases of ophthalmia neonatorum (5.92 per thousand); while during 1891, 1892 and 1893, among 97,493 cases, there were 488 cases (5.00 per thousand). Thus there has been a reduction of less than one case per thousand since legislation has attempted to diminish blindness from this cause.

"There are several reasons why the present New York law has not had the desired effect. To enumerate briefly:

"1. The provisions of the law have not become generally known among the profession and among midwives and nurses. No attempt has been made to call attention to the law. This being the

case, midwives would become aware of its existence only through a large number of convictions, with consequent fines and imprisonment for violations. Not more than twelve cases have been prosecuted and convicted since the law became operative.

"2. The term 'legally qualified practitioner of medicine' allows the midwife or nurse great latitude in the selection of someone to whom to report.

"3. The process of prosecution of an infringement of the law involves so much loss of time to the informant—the general practitioner or oculist—that the lack of enthusiasm shown in this direction is not surprising. The New York Society for the Prevention of Cruelty to Children is not only willing but anxious to prosecute every case of violation, but it can only obtain necessary information from the physician who sees the case after the damage to the eyes is done. Through the courtesy of Mr. Jenkins, the superintendent of this society, I have obtained much information concerning the steps necessary in prosecuting. The physician who meets with a case in which non-compliance with the law has resulted in injury to one or both eyes of a child, reports the case to the society; the latter conducts the prosecution, but the physician is the main reliance in securing a conviction, and without his attendance at the courts the society cannot succeed. This involves a loss of time, first at the Police Court on one or two occasions (twice, if the midwife secures an adjournment—and this the law allows); if she is committed, her trial takes place at some future date in the Court of General Sessions. In the Police Court trials it can generally be arranged to have the case called at an hour suiting the physician's convenience. In the second trial he must present himself at 10:30 a. m. and wait until the case is called. If the woman possesses a few dollars with which to engage a lawyer, she can secure an adjournment; in such a case the physician is compelled to be on hand some other morning at 10:30 a. m. and wait for his chance to testify. After such a tedious process he may have the satisfaction of having caused the punishment of a woman who has added to the number of blind through her ignorance or carelessness; but even this feeling of satisfaction is apt to be limited when the midwife is fined but a small amount. He has lost a great deal of time and considerable practice—practically he has given up two mornings and one or two afternoons, and has suffered many inconveniences. Is it surprising that his philanthropic ardor becomes colder after one such experience? Since September, 1890, there have been but twelve prosecutions;

all of these resulted in convictions: In every case a fine was imposed; in most cases it was small, in many only \$10, in one case \$100. In no case was the misdemeanor punished by imprisonment.

“For these reasons some modification of the New York law is absolutely essential. I would suggest the following as answering every indication and as tending to be effective: Every case of ophthalmia neonatorum should be reported to the local board of health or health officer—whether such a case occurs in private practice or in an asylum, whether under the care of a practitioner of medicine or of a midwife or nurse. In the case of a practitioner, whether in private practice or in an asylum, the board of health or health officer need not interfere. In the case of a midwife or nurse it should be the duty of this board, or of the health officer of the locality, to send an inspector, upon whom the responsibility of the case will then rest. If he finds that the midwife or nurse has called in a competent physician and that the child is being properly treated, there will be no occasion for further interference; but if he discovers that this has not been done, it shall be his duty to assume charge of the case and to see that the child is properly treated, either at its home or at some hospital or dispensary. He will then also be able to serve as a witness in the prosecution of such cases, and since he is in the employ of the city or town he will not be justified in finding fault if part of his time is occupied in the courts.”

These suggestions were adopted by the New York County Medical Society. At the recent meeting of the New York State Medical Society, Dr. Howe, through whose efforts the present law was enacted, spoke of its inefficacy, and had a committee appointed for the purpose of considering what steps should be taken to improve upon it and secure effective legislation.

ANTE-PARTEM OPHTHALMIA NEONATORUM (INTRA-UTERINE OPHTHALMIA).

Harry Friedenwald, M. D., Baltimore, (*Medical News*, March 9, 1895). The writer calls attention to the fact that although ophthalmia neonatorum develops, as a rule, on the second or third day after birth, there are a number of cases on record of children born with well-marked signs of the disease. “In these cases the period of incubation had passed, and the stage of inflammation was more or less advanced at birth.” He was able to collect the histories of eighteen such cases from medical literature and reports

an additional one which came under his own observation. Infection probably occurred soon after the rupture of the membranes, "the infectious material being carried in most cases by the finger of the examining physician or midwife." "The number of eyes that were thus lost by corneal involvement is exceedingly large. The result is stated in fourteen of the cases; in five of these the cornea escaped, but in nine corneal opacities resulted. Though the total number of cases reported is not large, still we do not hesitate to call this form of ophthalmia exceedingly dangerous. We would attribute the virulence of these cases in part to the prolonged contact of the eyes with the poison. In cases in which infection occurs during the short time that it takes for the head to pass through the vagina the contact may be very short, and then the eyes are almost always immediately washed. The duration of contact in cases of intra-uterine infection may be hours or even days." "The application of Credé's method would appear to us to be of service in those cases only in which the infection was very recent. Bellouard suggests the use of vaginal injections, especially in those cases in which the membranes rupture early." He cites cases in which strong solutions of mercuric chloride and nitrate of silver were employed in the form of vaginal injections, and in addition, Credé's method was used, and still ophthalmia developed; though seemingly indicated, they do not appear to have been of much benefit." This form of ophthalmia neonatorum is fortunately very rare, as shown by the meager number of cases reported, as well as by the fact that such large statistical tables as those of Credé appear to be unaffected by it."

TWO CASES OF DIPHTHERITIC CONJUNCTIVITIS TREATED
BY KLEIN'S ANTITOXIN.

Mr. W. H. Jessop. Report of the meeting of the Ophthalmological Society of the United Kingdom, held January 31, 1895. (*Medical Press*, February 13, 1895.) Mr. Jessop said that he had recently had two cases of true diphtheritic conjunctivitis which were interesting on account of their rarity and because they were the first in which the effects of the antitoxin treatment had been tried. In both cases Loeffler's bacillus was found and in both there were distinct membranes on the palpebral conjunctiva. The membrane seemed to melt away, and in neither case did the purulent or mucopurulent conjunctivitis appear, the conjunctivæ presenting their normal appearance within a few days after the membrane had separated. From the time of first seeing the patient to the

total disappearance of the membrane was, in the first case, three, and in the other four days. In neither case was any local treatment employed other than the application of distilled water. The patients were 8 months and 19 months of age respectively. In one there was marked diphtheria of the throat, in the other diphtheritic manifestations were mainly confined to the nares. He gave three injections of Klein's antitoxin in the first case of one drachm, and in the second case, two injections of a drachm each. Curiously enough there was an apparent relapse in first case, accompanied by the formation of a fresh patch of membrane on the left tonsil, but the bacillus could not be found in it, though carefully searched for. He pointed out that both cases would fall under the heading of membranous conjunctivitis, and he urged that the time had come for the term diphtheritic no longer to be applied to cases of conjunctivitis. The term diphtheritic had no necessary connection with the disease known clinically as diphtheria and was, therefore, misleading. Pseudo-membranous or croupous were terms open to even graver objections, and very different cases had been described arranged under the same heading. All cases of conjunctivitis with membranes were not diphtheritic or associated with Loeffler's bacillus, and it was not yet proved that all cases of conjunctivitis associated with this bacillus had a distinct membrane, further investigation being much needed, particularly as the bacillus was found in affections of the throat without membrane. He proposed, therefore, that all cases of conjunctivitis with membrane should be merged into one class of membranous conjunctivitis or ophthalmia, and that diphtheria characterized by Loeffler's bacillus might be mentioned as one of the causes of the disease, or, if preferred, membranous conjunctivitis might be subdivided into diphtheritic and non-diphtheritic.

THE QUESTION OF THE EFFICACY OF SUBCONJUNCTIVAL INJECTIONS OF MERCURIC BICHLORIDE IN OPHTHALMIC THERAPEUTICS.

Charles Stedman Bull, M. D., New York, (*New York Medical Journal*, January 19, 1895). Dr. Bull reviews Darrier's method of using these subconjunctival injections and his claims in regard to the results of this method of treatment. Review of the literature of the subject showed a great diversity of opinion among various observers as to the value of this new treatment. During the past year he had employed these subconjunctival injections in 48 cases, as follows: Parenchymatous keratitis, 6; abscess of the

cornea and hypopyon, 8; scleritis and episcleritis, 2; syphilitic iritis, 10; irido-chorioiditis, 15; traumatic orbital cellulitis, 3; sympathetic ophthalmia, 2, and syphilitic neuro-retinitis, 2. He summarized as follows: 1. The pain is always severe, in spite of cocain. 2. The reaction is apt to be severe, and is sometimes very severe. 3. The only classes of cases in which the sublimate injections seem to exert any positive effect in allaying symptoms and shortening the duration were those of scleritis and acute irido-chorioiditis of the non-syphilitic type. 4. The treatment is still on trial and should not be promiscuously employed in all sorts of cases as a routine treatment. It must stand or fall on its merits, and these can only be ascertained by careful and long-continued observations of a large number of cases. Severe pain and the occasional violent reaction produced by the injections must always be a bar to the universal employment of this method of treatment.

THREE VARIETIES OF EPIPHORA.

G. E. de Schweinitz, M. D., Philadelphia, (*The Philadelphia Polyclinic*, March 2, 1895.) Leaving out of consideration the great mass of cases due to inflammatory or obstructive disease in the puncta, canaliculi, lachrymal sac and duct, the writer separates cases of epiphora into three classes:

1. *The epiphora of refractive errors*, especially frequent in patients nearing the presbyopic age who go without required optic aid, and in moderate grades of astigmatism; occurring also in cases of imperfect muscular balance. "Therefore this rule should be followed in every case of simple epiphora: Thoroughly investigate the refractive condition of the eyes and correct it if anomalous."

2. *The epiphora of intranasal origin*. This is divided into that caused by irritation of the mucous membrane and that due to mechanical interference. "The rational management of certain types of epiphora must include thorough intranasal examination and treatment."

3. *The epiphora of nervous disorders*. This occurs in neurasthenia and hysterical patients and also in locomotor ataxia. "Epiphora, otherwise unexplained, may have significance from the neurologic standpoint, and should be so investigated."

SOME ADDITIONAL STUDIES UPON THE CLINICAL VALUE OF REPEATED CAREFUL CORRECTION OF MANIFEST REFRACTIVE ERROR IN PLASTIC IRITIS.

Charles A. Oliver, A. M., M. D., Philadelphia, (*University Medical Magazine*, October, 1894.) In making these studies to determine the causal factor of the apparent and transitory increase

of ametropia, the author ignored any cases presenting evidences of corneal or lenticular opacity, disturbances in the aqueous and vitreous and adhesions between iris and lens, and limited his observations to those eyes in which the pupils were dilated *ad maximum*.

By studying the plane of the iris by the use of the corneal loupe and by the estimation of the relative positions and sizes of the catoptric images, he found that there was *no forward displacement of the lens*.

The *index of refraction* and the *actual amount of either the aqueous or the vitreous were not increased* during the inflammatory process. This was shown, "first, by careful and repeated study of the objective appearances of successive layers of these two media, by both oblique illumination and the ophthalmoscope; and second, "by reference to the fact that in nearly every case the distance between the anterior and the posterior lenticular reflexes was unduly increased."

"To make certain that the temporary increase of the index of refraction is *dependent upon either spastic tonicity of the fibers of the ciliary muscle or congestion with rigidity of the ciliary bodies*" a number of control tests with both mydriatic and myotic agents were made. "In every case in which the inflammatory process had not absolutely subsided, the use of the cycloplegic reduced the apparent amount of the refractive error (ordinarily one-fourth to three-fourths diopter), whilst the myopic increased the apparent amount of ametropia."

"The conclusion, therefore, is in every instance of this third variety of study, not only is so-called "spastic accommodation" proved, but the supposition of the forward displacement of the lens is, in a great measure, denied, and both the real and relative increases of aqueous and vitreous humour are confuted."

THE ETIOLOGY AND TREATMENT OF INTERNAL STRABISMUS.

Howard F. Hansell, A. M., M. D., Philadelphia, (*Journal Am. Med. Assoc.*, February 16, 1895). In a lengthy paper, the writer considers "functional internal strabismus arising from the unconscious constant contraction of the ciliary muscle in its effort to sharpen the blurred retinal image of the hypermetropic eye." He calls attention to the fact that there is great diversity of opinion as to the part played by amblyopia, whether a cause or effect, and as to the result of tenotomy on vision. "Hypertrophic squint, notwithstanding conscious failures in its cure, remains where

Donders left it." He dwells at some length upon the bearing of the refraction, the vision and the innervation upon the coördination of the visual axes and arrives at conclusions as follows:

"1. Amblyopia is congenital and not acquired; is not improved by tenotomy when high or of long duration; is always present in monocular squint; is not a factor in alternating squint; can be replaced by full acuity of vision after the hitherto good eye has been rendered by accident or disease inferior to the squinting eye.

"2. In monocular constant squint, the cornea of the squinting eye is turned upward as well as inward.

"3. In concomitant or alternating squint, the non-fixing eye is turned upward as well as inward, and with transference of fixation there will be a transference of both the upward and the inward deviation.

"4. Donders's theory, extended to include all the muscles supplied by the third nerve, and not the interni alone, is a sufficiently satisfactory explanation of the upward deviation.

"5. Atropia and full correction are, in many cases, curative agents.

"6. All operations should be done under cocain anesthesia.

"7. In monocular squint vertical equilibrium must be restored by tenotomy, while in alternating, division of the interni is sufficient."

EXFOLIATION OF THE COCHLEA, VESTIBULE AND SEMICIRCULAR CANALS.

BY M. A. GOLDSTEIN, M. D.,
OF ST. LOUIS, MO.

IN the history of otology, reports of cases of exfoliation of the labyrinthian structure have always created more than a passing interest on account of their rarity of occurrence, the importance of their recognition and the value of the many clinical phenomena observed in the course of so extensive a necrotic process in the delicate structure of the temporal bone.

Caries and exfoliation of the cochlea alone, as a sequestrum separate from the rest of the labyrinth, has been observed and described comparatively frequent. From the interesting bibliography on the subject may be mentioned a comprehensive report by Bezold, of Munich; in a monograph published in 1886 are collected perhaps the richest statistics of necrosis of the labyrinth coming under the notice of an individual observer. In the clinical observations in a series of forty-six (46) cases, he summarizes the principal factors bearing on the subject, as follows:

Necrosis of the labyrinth occurs in the male with twice the frequency that it does in the female; children under ten (10) years of age are especially predisposed to this affection (18 cases in 43); the acute exanthemata, especially scarlet fever, play an important role as causative factors in the long-continued suppurative otitis, with its frequent tendency to involvement of the internal ear; the necrosis usually follows in the wake of a suppurative otitis of long standing; in two (2) cases only necrosis occurred after an otitis of eight months' duration; in twenty-one (21) cases the otitis was of four years' standing; in eight (8) cases, of twenty (20) years; only one case is cited where the necrosis of the labyrinth is described as the primary and the otitis as the secondary process; the exfoliation and elimination of the sequestra occurred in 37 of 46 cases cited during the course of the disease; in nine (9) cases death ensued before the elimination of the sequestrum. Larger sequestra, composed not only of the cochlea, but also of the vestibule, semicircular canals and pars acusticus internus, have been met

with but rarely. Such cases have been cited and described in detail by: Wilde (*Treatise on Diseases of the Ear*, 1854, p. 358); Shaw (*Transactions of the Pathological Society*, London, vol. VII.); Toynbee, (*Arch. f. Ohrenh.*, 1864, Bd. I.); Agnew, (*Amer. Med. Times*, vol. VI., p. 185, see Troeltsch, 1869, 2d Am. ed.); Voltolini, (*Monatschr. f. Ohrenh.*, 1870, No. 6);



FIG. 1.

Illustrating the existing facial paralysis on affected side. Prior to operation the patient had complete motor paralysis of right eye; the photograph, taken one month after operation, indicates considerable amelioration of the described condition.

Pomeroy, (*Transact. Amer. Otol. Soc.*, 1872); Blake, (*Ibid*, 1880, vol. II, p. 417); Pollak, (*Archives of Otology*, 1881, vol. X., p. 361); Sexton, (*Illus. Quar. of Med. and Surg.*, N. Y., January, 1882). In the two cases cited by Toynbee, the sequestra were not removed until after death. In the other cases, with the exception of those of Pomeroy and Pollak, the large sequestra

were removed through the external auditory meatus. In the case reported by Pomeroy the large sequestrum was exfoliated by a natural process of elimination from the opening of a sinus behind the auricle. In Pollak's case the necrotic process had advanced to such a degree that the sequestrum, the major portion of the temporal bone, was lifted out of position and removed by the surgeon's fingers, no instruments being required. Each of the cases recorded was attended by a very marked facial paralysis, great disturbance of gait and equilibrium, and complete deafness on the affected side.

The case herewith described may, perhaps, in consideration of the size of the sequestra and the numerous clinical phenomena recorded, deserve a recognition with the rarest cases of necrosis of the labyrinth as yet reported.

H. M., colored, male, 6 $\frac{1}{2}$ years of age, has always been well nourished and of average strength and activity. At the age of three years (December, 1891) patient contracted measles, from which he recovered without any of the frequent aural complications. One year later (November, 1892) an intense, acute ear-ache of several days duration ensued, followed by a copious purulent discharge; for eighteen months the discharge continued freely, uninterruptedly, without the accompaniment of any unfavorable symptom, the patient not even experiencing the slightest pain or difficulty in hearing. May 1, 1894, applied at the ear clinic of the Missouri Medical College Dispensary, where he received his first regular treatment for six weeks. During the following month the patient absented himself from the clinic.

July 17. Patient was admitted to the ear department of the Missouri Medical Polyclinic. His general condition and the suppurative process had now assumed a decidedly unfavorable aspect. The discharge had stopped, due to the plugging of the entire external auditory meatus with a cheesy mass, which, on examination, proved to be composed of partially dried and inspissated pus, epithelial shreds and detritus, emanating a thoroughly fetid and offensive odor. The entire posterior auricular region was very sensitive to the slightest pressure, the auricle assumed a position at right angles to the side of the head; the surface of the skin presented a sodden and irregular appearance; there was considerable induration, with distinct points of fluctuation, especially above a circumscribed area in a line with the upper margin of the auricle. This was incised and drained of about one and one-half ounces of green, fetid pus. A marked and almost

complete facial paralysis was demonstrable on the affected side. A small sinus, from which a spicula of bone had been recently discharged, was present, situated one-half inch posterior to the insertion line of the auricle and in a line with the posterior border of the lobule. Such was the condition existing when I took charge of the case, August 3.

August 5. The patient was prepared for operation. I made a long, free incision, connecting the upper, postero-auricular abscess opening with the orifice of the sinus described. Hemorrhage was profuse and difficult to control, owing to the disorganized condition which the tissue in the field of operation had assumed by the long continuation of a severe necrotic process. A firm pressure by broad retractors was applied, and a free opening to the bone made. Placing a curette in position, preparatory to the removal of the necrotic bone mass, I observed a serious condition. The entire area was one rotten mass, and could have been more easily ladled out with a spoon than removed with a curette. After considerable manipulation with curette, forceps and irrigator, I succeeded in exposing to view a sinus, leading downward and forward, with a depth of nearly two inches, and diameters varying from one-half to one inch. The parts were thoroughly irrigated with bichlorid of mercury solution (1-1000), which was a difficult task, under the circumstances, as a communication had been established through free exposure of the Eustachian tube between the ear and naso-pharynx, and, there was considerable danger of asphyxia and accidental complications while the patient was under chloroform. The wound was well dusted with iodoform, packed with bichlorid gauze, and a well-padded compression applied. One hour later the little patient was up and walking part of the way home.

The following day I removed the first dressing. The discharge was profuse and the odor excessively fetid. Irrigated with warm bichlorid of mercury solution (1-1000). The patient swallowed a considerable portion of the solution. The communication between the large posterior opening and the auditory canal was free and drainage good. The cleansing and dressing of the wound caused the patient no discomfort, beyond that of the fluid entering the nasal and pharyngeal cavities during irrigation. The advantage of such an irrigation, in which the wound, the ear, nose and pharynx were simultaneously cleansed, is self-evident. It was noticed after the second dressing that the motor paralysis of the right eye had partially subsided, and that the patient was now

able to close the eye within one-quarter inch of complete closure. The dressings were reapplied daily for three months with but slight change in the general appearance of the wound or patient. Throughout the entire course of treatment, since the operation, there has been absolutely no pain, tinnitus aurium, vertigo, nausea and vomiting, or febrile reaction.

About the first week in November a change was noted in the general condition of the patient. He became restless, peevish, and complained of a general feeling of lassitude with a constant drowsiness.

The clinical memoranda appended will show the most interesting factors in the development of the case.

November 5. On redressing the wound, noticed for the first time a necrotic mass of bone, black in color, rough in surface appearance and touch, projecting from the antero-lateral wall of the posterior auricular sinus. Discharge profuse and intensely fetid.



FIG. 2.

Main sequestrum; outer side; natural size.

The beautifully preserved spiral of the cochlea stands out almost like an isolated picture from the rest of the petrosa. The full size of the exfoliated mass is well indicated.



FIG. 3.

Main sequestrum; inner side; natural size.

The relationship of the labyrinthian structures is here clearly represented. Adjoining the prominent cochlea is the vestibular space with the ampulla plainly visible; also a considerable portion of the posterior semicircular canal. At the further end of the specimen is the honey-comb mass of mastoid cells. The specimen measures 36 mm. in its longest diameter; 18 mm. in its broadest diameter.

November 6. On irrigation, numerous soft, long discolored shreds were washed away. Discharge in 24 hours amounting to half an ounce of viscid, greenish, foul-smelling pus.

November 7. The black necrotic mass appeared nearer the surface of the sinus orifice. When touched with the tip of the irrigating syringe, it was found to yield slightly. With a strong shanked, milled-pointed dissecting forceps the mass was firmly grasped, the head of the patient steadied, and by gentle, steady

traction, the entire sequestrum was painlessly removed, through the fistulous opening. Not the slightest hemorrhage ensued, even oozing being scarcely perceptible. The entire proceeding was borne by the patient without the least expression of pain or a single unfavorable symptom. The wound was lightly packed with iodoform gauze and the auditory canal cleansed and dried. Sound tests were then instituted, as hereinafter described.

November 8. The discharge diminished to one-third the quantity, issuing only from the auditory canal. The posterior wound, through which sequestrum had been removed, was clean, the gauze strip being removed almost dry and without stain. Inspection reveals the walls smoothly lined with numerous soft granulations. The fetor had disappeared. Drainage free. Antiseptic irrigation used throughout the treatment. Walking and standing tests for equilibrium were made.

November 9. The discharge remained odorless; quantity unchanged; general condition much improved.

November 11. Patient had again assumed his former lively disposition; ate heartily; slept soundly; rarely offered a complaint of discomfort. Perceptible decrease in the quantity of discharge.

November 12. On inspection by illumination, after thorough irrigation, detected a flat oblong sequestrum at distal end of long sinus, and gently removed same with forceps. Removal painless and without the slightest sequence. In the depth of the wound canal a pulsating or oscillating fluid, seemingly clear and shining, was discernable, and supposed to be the mucous of the exposed Eustachian tube.

November 13. Only traces of pus in the external auditory meatus; small, soft necrosed masses detached from the depth of the canal and removed with forceps and syringe.

November 14. Mirror illumination in wound canal revealed the presence of a necrotic bone mass attached to the posterior wall of the sinus. Examined with probe, it was found loose, and with forceps this, the third sequestrum, was easily removed.

November 15. Discharge very slight. Another small sequestrum was removed from the upper wall of the sinus. Numerous healthy looking granulations were observed in the depths of the sinus. Patient began to cough; a hoarse, short cough with frequent expectorations.

November 16. Discharge practically *nil*; a slight serous exudation noticed; similar to that found on granulating surfaces. Profuse granulations filling sinus.

November 20. Again some slight discharge. Located a small focus near the distal end of the bony portion of the internal auditory canal, with accumulations of epithelial shreds and pus.

November 25. Discharge of a yellowish green color, of thick consistency and increasing quantity. Cough had become more aggravated, loose, and expectoration profuse and of a muco-purulent character. Microscopical examination of the sputum revealed the presence of the tubercle bacillus in large numbers.

December 10. A bone sequestrum presents near the wound orifice. By restlessness of patient during attempted extraction, the mass was pushed out of place. Free communication between the sinus and the external auditory canal exists, as indicated by the probe in manipulation.

December 11. The sequestrum again presents, this time in the external auditory canal; presents with long diameter of sequestrum transversely to the axis of the external auditory canal. After some manipulation succeeded in turning and removing the rounded necrotic bone mass from the posterior sinus.



FIG. 4.

Sequestra in the order of their removal; natural size; all four sequestra were painlessly removed through a sinus of about three-quarter inch average diameter. The operative procedures, including the removal of the sequestra, extended over a period of about six weeks.

December 15. No discharge; wound looking comparatively dry. Irrigated thoroughly and dusted canal and wound with iodoform; very small gauze strips inserted.

December 19. Both wound and auditory canal dry; dressing of four days' standing removed dry and unstained.

January 5. Condition of wound unchanged. The patient was in lively spirits, talkative, and felt no discomfort from his recent siege of treatment. He was considerably emaciated, cough was still very harassing; expectoration profuse. Physical examination revealed the following: In the apex of the left lung there was cavernous percussion sound and rales. Over the entire area of the

right lung mucous rales, with slight percussion dullness; harsh inspiration over the right apex; prolonged expiration of high pitch; numerous subcrepitant rales. History of case points to the probability of a rapidly developing phthisis pulmonalis. The mesenteric glands are enlarged and easily localized by palpation. The cervical and other lymph glands of the head present almost a "rosary" outline, so general, regular and continuous is their enlargement. The sputum contained numerous tubercle bacilli. Emaciation of the patient had been marked and rapid the previous few weeks. A phthisical febrile reaction noted; rise of temperature, accompanied by night sweats and continued coughing.

By far the most interesting and important factor which presents itself for consideration in this case was the existence of the faculty of hearing on the affected side after removal of the cochlea and deep structures of the petrosa.

I have been thoroughly cognizant of the difficulties and responsibilities attending an effort to substantiate so radical a statement, and have necessarily adopted the most careful methods and delicate tests to convince myself of the accuracy of my conclusions. The most serious obstacle to contend with was the exclusion of the healthy ear from the sound tests which were instituted. In the majority of the tests made I adopted the method suggested by Dennert and Lucæ, with modifications. In determining what degree of sound perception still exists in an affected ear in a case of one-sided deafness, the healthy ear of the patient is stopped, turned towards the source of sound and the tests then made, the affected ear being alternately opened and closed. Whatever difference in the hearing then elicited, is attributed to the affected ear.

A more delicate modification of this method has been successfully used by Burnett. The patient is so placed that the affected ear is toward the operator. The healthy ear (not the ear to be tested) is plugged. With the affected ear open, hearing tests are then instituted. Having thus reached the apparent limit of the hearing power of the affected ear, that ear is then closed, and the tests continued. If the closure of the deaf ear causes no difference in the hearing distance already obtained, it is fair to conclude that whatever amount of hearing exists is not due to passage of sound through the external auditory canal of the affected ear turned towards the test. In such a case the conclusion must, therefore, be that sound has reached the brain through the agency of the healthy ear. If, however, the stoppage of the affected ear is accompanied by an absolute inability to hear sound tests, it is

again rational to conclude that this difference in the hearing power must be attributed to the affected ear. Thus, the final conclusion: "Whatever is heard just as well with the deafer ear stopped as when open, the better ear remaining stopped throughout the testing, must still be heard by the better ear through the head; but whatever is heard only with the worse ear open, the good ear being stopped, must be attributed to the worse ear."

The question might be asked, why cannot sound be conveyed to the deaf ear through the head; if it is conveyed to the better ear which is stopped and turned away from the sound source? The reply would be that an ear which, either when stopped or open, perceives no difference in sound conveyed by the meatus, is not sensitive enough to hear sound conveyed to it through the head.

In the consideration of the case at hand, bone conduction tests by aid of tuning forks were excluded, as they were deemed less delicate for a differential than aerial sound conduction. Furthermore, as our dealings were directly with an exfoliated labyrinth, the tuning fork, relative to bone conduction, was practically of no value.

The following tabulated notations will indicate clearly the conclusions reached in hearing tests of the affected ear:

HEARING TESTS.	Hearing capacity with both ears closed.	Hearing capacity with affected ear open and good ear closed.
Loud conversation.....	800 cm.	900 cm.
Whispered conversation.....	80 cm.	90 cm.
One hundred and fifty centimeter watch.....	5 cm.	15 cm.
Politzer's acoumeter, designated by patient as a loud ticking watch.....	15 cm.	35 cm.
Galton whistle; pitched high.....	30 cm.	60 cm.
Differentiation in sound of C from C' tuning fork.....	8 cm.	35 cm.
Musical notes of a long sounding-harmonium. Differentiation of C (3d octave) from C (5th octave).....	35 cm.	90 cm.

In the execution of the enumerated tests the patient was blindfolded; the plugging of the meatus was done by a competent assistant, the fore-finger being used as a tight plug. Taking into account the age of the patient and all tendencies to a possible misrepresentation of the hearing capacity, the tests were repeated at frequent intervals with many variations; yet the tests proved doubly valuable, owing to the demonstrable accuracy of the patient's statement.

Next in the order of importance of the clinical phenomena observed, was the preservation of the equilibrium and balance of the patient. As previously stated, one hour after the operation, patient was up and walking home with absolutely no trace of altered equilibrium. Walking and standing tests have been repeated frequently, varying the same in every conceivable way by blindfolding the patient, testing with eyes closed, permitting the patient to walk under the influence of loud noises, etc. The results were always positive; his gait firm and steady; the power of equilibrium preserved to a nicety.

A factor of great interest was the prominent role played by the bacillus tuberculosis in the development of this case. Early in the history of the case a microscopical examination was made of the discharge from the ear and the presence of the tubercle bacillus demonstrated. A physical examination at that time gave no indication of a phthisical onset. The free communication of the suppurative aural focus with the pharynx; the tendency to frequent swallowing of this purulent material infected by the tubercle bacillus; the gastro-intestinal disturbances; incessant coughing; profuse expectoration; febrile reactions; enlargement of the lymphatics of the entire system; rapid emaciation; great prostration; and, finally, the involvement of the lungs, as determined by recent examination; the demonstration of the presence of the bacillus tuberculosis in the sputum—this well-marked series of symptoms point to a development of a rapid phthisical process. It seems rational and reasonable to conclude that this acute phthisis is, perhaps, a secondary development of the original tuberculous process in the ear.

In maintaining my position in the case at issue, with my conclusions drawn from the careful tests made and clinical phenomena observed, I realize that I am treading on delicate ground, and that the presentation of these results opens for consideration a new phase of development in the theory of sound, and in the complicated functions of the labyrinthian structures.

It is not my purpose to discuss the pros and cons of the theories which the results attained in the present case may suggest, but to indicate in the presentation of this series of simple firm facts, the existence of some inaccuracies in the now accepted theory of sound, and in the functioning of the semicircular canals in relation to balance and equilibrium.

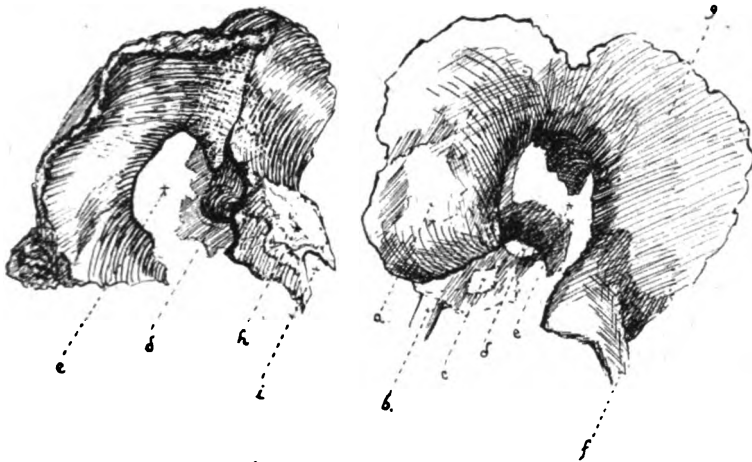
POST-MORTEM NOTES.

The diagnosis and prognosis of a rapidly-developing and speedily-terminating miliary tuberculosis, as a complication and

infection secondary to the aural disease; in the case at issue, as expressed in the preceding pages, was thoroughly substantiated in less than one month after presentation of patient and complete demonstration of the results attained, before the local medical fraternity.

January 5. Patient was presented at the Saint Louis Medical Society. He was then bright, active and in good spirits.

January 15. General depression; painful, incessant cough; profuse expectoration, showing bacillus tuberculosis abundantly on microscopical examination; intense dyspnea; febrile disturbances; abnormal pains; severe diarrhea. The only cerebral symptom, mild stupor. Progressive emaciation and prostration with continuance of these symptoms was followed by the death of the patient January 29.



FIGS. 5 AND 6.

Necrosed temporal bone. Post-mortem removal. a. Mastoid process. b. Styloid process. c. Cartilaginous external auditory meatus. d. Necrotic sinus of about three-quarter inch average diameter, through which sequestra were removed. e. Area of necrosis. f. Zygomatic process. g. Squama. h. Remnant of posterior surface of petrosa, with the internal auditory meatus partially intact.

Unfortunately permission was not granted for a complete autopsy. The right temporal bone was removed, and the involved area carefully inspected.

The dry antiseptic dressing, applied ten days before, was removed perfectly clean. The post-auricular region showed but moderate depression at the site of so extensive a necrotic process; the sinus was almost closed, scarcely admitting a large probe.

Examination of the affected temporal bone, after its removal, corroborated our descriptions of the necrosed and exfoliated areas. Circumscribing the region of the osseous external auditory meatus, and involving the mastoid and squama, with a radius of about three-quarters of an inch, was a necrotic zone with irregular, but well defined margin. Designating this as the base of a long, cone-shaped canal, we note an axis of about two and one-half inches in length, directed inward, downward and backward, with its apex merging into the Eustachian tube. This cone-shaped sinus, through which the exfoliated bone masses were removed, was filled with quite firm, closely meshed granulations. All landmarks of the osseus meatus auditorius externus and cavum tympanum had disappeared. Of the petrosa, the superior wall and part of the posterior portion of the meatus auditorius internus still remained intact. Examined while fresh, the portion of the nervus acusticus, lodged in the depth of this canal was to all appearances normal in color and consistency.

After removal of the bone, the exposed cavity was carefully examined, with special stress laid on the cranial areas in direct relationship to the necrosed bone. On the periosteal surface of the bone still remaining, numerous erosions and irregularities were noted, yet the dura mater at all points was perfectly firm and intact. With the existence of a so disseminated and rapidly progressing tubercular process, our anticipations of the presence of a tubercular meningitis might have been well founded; the most careful and detailed search, however, failed to reveal any meningeal lesion whatever.

As it is not my intention in the present article to enter into a discussion of the probable theories of the physiology of sound, neither do I propose suggestions relative to these post-mortem notes.

It may be remarked that in a case of miliary tuberculosis, with the primary infection an aural one of long standing, and a necrosis, which by its extensive bone destruction, exposed to direct contact with the specific suppurative processes the largest portion of the temporal lobe, lateral sinus and temporal section of the internal carotid artery, the absence of any meningeal or cerebral complications must be considered a rare occurrence.

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AN UNUSUAL CASE OF AURAL DEFORMITY;
OPERATION.BY J. HOLINGER, M. D.
OF CHICAGO.ASSISTANT SURGEON, EAR DEPARTMENT, ILLINOIS CHARITABLE EYE AND
EAR INFIRMARY.

R. H., a girl, 14 years of age, came to the Illinois Charitable Eye and Ear Infirmary because hearing in her right ear had been growing poorer, besides, she had been troubled by subjective noises and occasional attacks of dizziness. Examination revealed a somewhat retracted drum-membrane; whispering heard at 20 cm. All these symptoms improved greatly within a short time. The patient was not well developed physically for her age and she articulated with difficulty, but her answers showed that she was fairly well developed mentally. In the external angles of the eyes two reddish tumors of the size of a bean attracted the observer's attention; they appeared most distinctly when the eyes were turned as far inward and upward as possible. Dr. Beard removed these growths.

Of greater interest was another much greater deformity, which was hidden very neatly by her hair. The whole head, especially the face, was assymetric. The left facial side was inferior to the right in all dimensions and showed a marked depression which extended from the ramus of the lower maxilla to the linea-temporalis, and from the zygoma to the occipital region. The lowest point was the ear. The lobule was a little smaller than normal but it seemed as if the superior point of insertion of the concha had been drawn downward and forward toward the external angle of the mouth, from which it was only $1\frac{1}{4}$ cm. removed. The line of insertion formed three-quarters of a circle, and the free margin of the concha was bent upon itself forward and at an acute angle. The tragus was missing, so that one could look through the open quadrant into the funnel-shaped external canal, which at slight depth, was impervious to thin probes. In the same anesthesia, in which Dr. Beard removed the growth from the second eye, the concha was corrected with the kind assistance of Drs. Morgenthau and Hardie. Half the concha

was dissected from its broad and flat attachment to the cheek, and sewed to an incision in the vertical prolongation of the still adherent part. The force necessary to bring together by stitches the original 2 cm. broad insertion caused the incision to gape sufficiently and enabled us to avoid sacrificing any skin at the posterior incision, although the wound in the cartilage on the posterior surface was 1½ cm. broad; at the same time the strong tendency of the concha to dip forward, *i. e.*, to double upon itself could be combated in a fashion similar to that adopted in operations on fan-ears. To be sure the mouth was drawn somewhat toward the side operated upon and a slight ectropium was produced. Both, however, disappeared soon. The result of the operation was a small vertical cicatrix in front of the ear, and a somewhat pointed ear; the latter was produced because the whole of the dissected margin was not stitched to the incision, but the free portion was rounded and covered with skin. The point was formed by the original attachment of the helix to the cheek and was at the same height as the other ear.

This case is also worthy of attention in anatomical and embryological directions. The lower maxilla can be moved from side to side. The ascending ramus with the coronary and articular surfaces is entirely wanting. The masseter is very weak, and the temporal muscle cannot be felt either during mastication or while at rest. It was not possible to investigate the smaller muscles. Since the field of operation extended forward into the cheek we expected to meet with the temporal artery, but no vessel of its size was encountered. Only at the lower angle of the wound there was a severe parenchymatous hemorrhage from the parotid gland, which was in its normal location. The oral cavity appeared normal in front and to the right. On the left side, however, the alveolar processes of the upper and lower maxilla were increased to twice their normal thickness; and all of the teeth back of the two canines stood at the sides and margins of the jaws in all possible directions and were unfit for masticating. The velum hung down loosely on the left side, following passively the movements of the other side. This proved very important during the narcosis. After the patient had been in excellent anesthesia for more than half an hour, sudden spasmodic inspiratory movements set in, as if the tongue had fallen back. Although this was immediately drawn forward, matters grew worse; *i. e.*, the inspiratory attempts became light and superficial, the pulse slow and thread-like, the wound stopped bleeding, and there was great cyanosis. On opening the mouth widely it appeared that the velum

was stretched and drawn to the root of the tongue. Introducing the finger in the manner customary in examining the naso-pharynx, the uvula was drawn with some difficulty from the glottis; and after performing artificial respiration pulse and breathing became normal. The same thing occurred twice during the anesthesia, and was remedied in the same way.

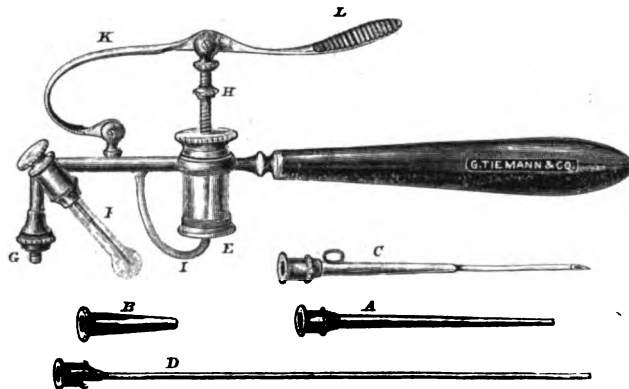
Now the question arises, how can we explain this malformation? Against its originating post-partum we must adduce the deformity of the concha, which shows its later shape very soon. The same holds good in regard to the later intra-uterine period. We must, therefore, go back to the first and second months of the fetal period. In the second month—the fetus being 1.5 *cm.* long in the beginning and 3.5 to 4 *cm.* at the end of the month—the shape of the external ear is already a rather well defined one. We must therefore go back to the second half of the first month, perhaps between the 20th and 30th days. The embryo is 5 to 8 *mm.* long; the branchial clefts are already closed, and the parts of the branchial arches begin to adopt their later forms. The osseous portions contribute to the formation of the middle ear; the membranous, to the external ear. In our case accurate investigation of the middle and inner ear was not practicable because the external canal was closed, but examinations with tuning forks pointed to the existence of an inner ear. Others, however, who have had opportunity of examining similar cases post mortem, found the inner ear intact. This fact, the general condition, and the shape of this concha, appear to justify the following explanation:

The entirely different origin of the external and internal carotid from the ventral and dorsal aortas (the stage persisting in fishes) suggests that the mandibular arch suffered in its nutrition by irregularities in the closing of the primary aortic arches of this side; that, as a result, it was temporarily arrested in its development and finally, on meeting the other side, and closing the face it brought with it the upper part of the auricles. This appears all the more plausible because the upper part normally is the last to develop while the lower part (*i. e.* lobule and external canal) is more firmly anchored to the middle and inner ears which, meanwhile, have grown inward, away from the surface.

THE INJECTOR OF DELSTANCHE, WITH MODIFIED MIDDLE EAR TIP.

BY DAVID N. DENNIS, M. D.,
OF ERIE, PA.

THE instrument here described does not seem to be as generally known among the otologists of this country as its merits deserve. The instrument was devised by Dr. Chas. Delstanche, of Brussels, and is called by him an Injector and Aspirator. The instrument is really a small syringe, but so arranged that fluids do not come in contact with the packing. From its shape and method of use the field of operation can be kept in full view. It is easily and quickly handled; the tips can be held perfectly still and rigid when in use, not the tendency to thrust deeper that there is in using the ordinary middle ear syringe. The instrument is made of metal and glass. The accompanying illustration explains its form and construction.



The cylinder *E* is similar to a short hypodermatic syringe, the spring which is a continuation of the thumb-plate keeps the piston out to its full extent. By depressing the piston the impulse is carried through the pipe *I* to fluid contained in glass receptacle *F* forcing it out at *G*. The glass receptacle is detachable, permitting of thorough cleansing. Considerable force can be given to the

stream or it can be forced out drop by drop. The sharp cannula *C* is for hypodermatic use in and about the ear. The stop *H* regulates the amount thrown out. The attachment *B* is adjusted to fit a Eustachian catheter, and is used to throw medicine into tube. The original model has numerous pipes of steel curved in different directions. A cannula of pure silver has been substituted for the numerous ones of steel. This makes it possible to bend the tip into any desired shape. I have used a silver cannula as an attachment to the ordinary middle ear syringe for a number of years, and find it a great improvement over the steel ones ordinarily supplied with these instruments. The injector is also of use in washing out or medicating the nostrils where it is desirable to see the field of operation. The instrument has been made by George Tiemann & Co., of New York, after the original model.

ABSTRACTS FROM CURRENT FOREIGN OTOLOGICAL LITERATURE.

By T. MELVILLE HARDIE, B. A., M. D.,
OF CHICAGO.

PYEMIA OF OTITIC ORIGIN.

Hessler contributes an interesting paper on pyemia of otitic origin to the *Archiv. f. Ohrenheilk*, XXXVIII, 1 and 2. He devotes considerable attention to the condition of the lungs in pyemia following sinus phlebitis, and as his conclusions are somewhat radical they will at any rate be read with interest.

After a careful review of the literature he has been able to find but 10 well defined cases of pyemia with sinus phlebitis and metastases, in which the lungs were free from metastatic abscesses. These are very briefly referred to. In 14 additional cases the pulmonary condition was not described, while in 134 cases metastatic abscesses in the lungs were demonstrated post mortem. He has further collected 83 cases in which the pyemic symptoms during life suggested sinus phlebitis, which was too demonstrated post mortem, but in which there were no metastatic abscesses discovered; further, 24 cases of the same sort which terminated in recovery. Of the 40 cases of pyemia with metastases which recovered, there were 19 in which the lungs were affected. In 38 cases, in which the sinus and jugular veins were treated surgically, symptoms referable to the lungs were present in 17, although lung symptoms were absent altogether in but 7 of the remaining 21.

In a further series of 24 cases which were operated upon, there were 17 with abscess in lungs and other organs, as against 7 in which the lungs were not affected.

We have therefore, in all, 238 cases, in 17 of which the pulmonary condition was not noted, in 41 of which there were present metastases in various organs, but not in the lungs. and 180 cases in which the lungs were also involved.

Hessler, however, greatly doubts the correctness of this estimate. He has frequently found cases described in which during life there were neither objective or subjective symptoms of lung trouble, but in which the post mortem examination showed numerous hemorrhagic and purulent metastases in the lungs. It is also well known that the pulmonary symptoms are frequently of very short duration, and if the examination is not made soon after the infection, or if the abscesses are not numerous or superficial, their presence may easily be overlooked.

We must conclude that those cases of pyemia in which metastatic infarcts are not present in the lungs, as well as in the other organs, are infrequent; that cases do exist in which no metastatic infarcts in the lungs occur, although sinus phlebitis was shown post mortem, and in which, on the other hand, they are occasionally present when post mortem examination shows no sinus phlebitis.

Hessler takes exception to certain of Koerner's conclusions (*Die otitischen Erkrankungen des Gehirns, der Hirnhäute und der Blutleiter*, 1894): (1) That embolic metastases are more frequent with sinus phlebitis than with osteo-phlebitis. (2) That the ear affection causing the phlebitis is more frequently acute than chronic. (3) That the metastases following sinus phlebitis are almost always in lungs, while in osteo-phlebitis they are usually in joints and muscles. Hessler's statistics controvert all three positions. Koerner's pathology and treatment are next considered and not agreed to. With regard to treatment Koerner considers it sufficient to remove the seat of the disease in the temporal bone. In Hessler's opinion it is not enough to give free exit to the pus from middle ear and mastoid cells. If the pyemic symptoms do not disappear after paracentesis, extraction of polypi, opening of mastoid and exposing of the sinus, ligation of the jugular must be done so that in the lighter cases the further taking of osteo-phlebitic particles into the circulation may be prevented, and in the graver cases, that the process may be confined, if possible to the sinus and jugular vein. Unfortunately exact diagnosis is in the present state of our knowledge often very difficult, and each case must be treated on its merits after a careful consideration of all of the symptoms.

Hessler's article concludes with a recital of the symptoms observed in pyemia with metastases in which the sinus is only partially affected, and in which the prognosis is favorable. Nine cases' histories are appended.

THE RATIONAL TREATMENT OF ACUTE OTITIS MEDIA.

An elaborate study of the treatment of acute inflammation of the middle ear from both a clinical and a bacteriological standpoint is undertaken by Gradenigo and Pes in the *Archiv. f. Ohrenheilk.* XXXVIII, 1 and 2.

Gradenigo's aim is to find a method of treatment based upon the facts we have learned from bacteriology and one which at the same time conforms to the well established rules of present day surgery. Some idea of the care which has been taken in the preparation of the article may be gained from the fact that there are 142 references to the literature of the subject. The historical sketch is sufficiently complete and the authorities carefully ranged in favor of or against the various methods in vogue. Treatment of the nose and nasopharynx, poultices, hot and cold water applications (of which the most extraordinary is de Rossi's instillations of ice water), the air douche and catheter, the stage of the disease in which paracentesis is indicated, the many antiseptics and astringents are all discussed and the point made that the only things agreed upon are paracentesis and asepsis.

Gradenigo thinks it of the utmost importance from a therapeutic standpoint to study the development and progress of the disease. It is known that acute otitis media can be caused by any one of several micro-organisms; of these comes first the diplococcus of Fraenkel. Nevertheless accessory causes are not to be overlooked, especially chronic catarrhal conditions; the divisions of middle ear inflammation into catarrhal and purulent cannot be admitted from the bacteriological standpoint. The development of an acute process depends largely upon factors apart from the micro-organisms. Netter found in the ears of young children the same microbes which are present in acute middle ear inflammation in the adult. Further observations in this direction are necessary.

If we except cases in which there is a traumatic lesion of the drumhead, we may conclude that all infections of the middle ear are secondary and that the micro-organisms enter the middle ear by the Eustachian tubes. Gradenigo believes that infection takes place in this way even in typhus, measles, scarlet fever, pneumonia, etc., in all of which the general condition of the patient and the resisting power of the mucous membrane are greatly lowered. While over 100 species of micro-organisms have been described as existing in the naso-pharynx, the sort of germ is obviously of much more moment than the number of kinds present. It is further known that many pathogenic micro-organisms do not possess

under all circumstances sufficient virulence to cause an acute infection, but are apparently influenced by chemico-physical conditions with which we are not sufficiently familiar. It is therefore impossible to predict for any particular micro-organism any certain course. Furthermore, although but little remains to be learned as to the kinds of germ which can set up an acute inflammation, no one has up to the present made bacteriological control-examinations of the various methods of treatment. This the authors have endeavored to do.

When the infectious character of the disease was known, trials were made with antiseptic solutions. These were unsuccessful, because the quantity of the weaker strength which could be used was relatively too small, and stronger solutions would cause so much irritation as to aggravate the process, and even if one could use enough of a strong solution the folds and thickness of the mucous membrane and irregularities of surface in the middle ear make thorough asepsis impossible. One can observe also that the inflammatory process in the middle ear as in other organs has a tendency to pursue a certain cycle. An adequate knowledge of this course is necessary to the correct treatment.

Another question which arises in many cases is that of paracentesis. It is of course possible to change by means of this operation a catarrhal into a purulent inflammation if proper antiseptic precautions are not observed, and it may be even a dangerous operation if, through uncleanness or irrational inflations, a secondary infection occurs.

While Gradenigo considers the air douche injurious he thinks the use of antiseptic irrigations equally pernicious. The increase in the pain follows the washing at a certain interval and for this reason is frequently not ascribed to it, especially if the washing out of the ear is practiced often. Washings are recommended to prevent a collection of pus in the external meatus. The aim is better attained by drainage. The washings may in some who have sensitive skins cause eczema, furuncle, etc. Even more may properly be urged against irrigation *per tubam*.

Against too rapid conclusions as to the therapeutic worth of any particular treatment the authors urge the fact that acute inflammations of the middle ear last a very variable time. However, in children and in adults with scars which are easily broken through, spontaneous perforation occurs early, and as a rule recovery takes place in a few days. With chronic catarrh and thickened drumheads severe complications frequently occur, while in the

aged, in whom the inflammatory process is not so acute and in whom the exudation remains in the middle ear for several months, marked deafness and severe subjective symptoms result.

Gradenigo's method of treatment is as follows: "When the acute otitis is in the first stage, the pain having lasted but a few hours or having moderated, when only the upper segment of the drumhead is reddened and the hearing power on the affected side is still good, an abortive treatment should be instituted, *i. e.*, rest in one's room or in bed, light diet, gargles, washing of nose with lukewarm salt water and instillations in the ear of 1.5% to 2% solution of carbolic acid. The use of a solution in glycerin is in the author's opinion irrational. Carbolic acid in glycerin or in oil has a very weak antiseptic action. The watery solution works more energetically; to prevent maceration of the epithelium a 0.8% salt solution is added.

If the abortive treatment fails, an early vertical paracentesis in the posterior segment of the drumhead is made. Before the operation the auricle and external meatus are to be washed with a lukewarm 1:1000 sublimate solution, and a little of a 10% cocain solution in 1% carbolic acid solution dropped in the ear. After the paracentesis, and whether exudation occurs or not, neither washing or other irritating operation is done, because if exudation is present it will shortly find its way out, and if none be present the artificial perforation will close in twenty-four hours without complicating matters. If the perforation does not appear to be large enough a second incision is made which crosses the lower end of the first at right angles. The pain is much lessened by the use of cocain. While exudation takes place the perforation is to be kept open and all washings are to be avoided. To prevent the too early closure of the perforation drainage is to be secured thus: After perforation the secretion and blood in the meatus are carefully removed by means of a tampon so used that the drumhead is not touched. Only when the secretion is very great is a lukewarm 1:10,000 sublimate solution gently used. Then with a forceps under aseptic precautions and using the eye and speculum, a thin strip of iodoform gauze is deeply inserted in the external canal, the end of the gauze is, however, not allowed to touch the drumhead which it would irritate. The correct insertion of the tampon is of great importance, since if too deeply inserted it cannot be borne, and if not inserted far enough it will not prevent the pus collection in the deeper part of the meatus. The strip of gauze makes possible capillary drainage. At the outer end a few layers of

iodoform gauze are placed, and if the secretion is very abundant, absorbent cotton and gauze may be applied and a bandage put on. If necessary the dressing may be applied twice a day. Sometimes the absorbent cotton may be attached to the auricle with collodion. When after two or three weeks the acute symptoms have disappeared but pus is still present, an ear bath, lasting fifteen to twenty minutes, of a 1:10,000 sublimate solution should precede the dressing—of course a large opening in the drumhead must exist. The air douche was very rarely used and Gradenigo believed that it not infrequently caused a recurrence of the acute symptoms especially in children.

Fifteen case histories are given by way of illustration.

TRANSPARENT MACROSCOPIC PREPARATIONS OF THE ENTIRE ORGAN OF HEARING.

Katz, (*Berliner Klin. Wochenschr.*, 1895, No. 1). Katz's method is a modification of one published by him in the *Archiv. f. Ohrenheilk.* XXXIV, by means of which transparent sections of the temporal bone, including the soft parts, nerves, blood vessels, etc., can be prepared.

Osmic acid is introduced to the nervous apparatus either by the oval window or through an opening made in a semicircular canal. The bone is then placed in a $\frac{1}{4}\%$ chromic acid solution, to which has been added 10 ccm. of a 1% osmic acid solution for four to six weeks. Then successively in 20% (saltpetre säure) for decalcifying, and 90% alcohol. Then with a razor the part selected is cut out and placed first in absolute alcohol and then in xylol. The object is transparent in twenty-four hours and is mounted in balsam in glass cells. The cell wall is plane so that the object may be magnified.

THE STAPHYLOCOCCI AND OTORRHEA.

Lermoyez and Helme, (*Annales des mal. de l'oreille*, etc. Jan., 1895).

1. Acute otitis media is often mono-microbic at the onset; the pus collected at the moment of paracentesis as a rule contains but a single pathogenic species.

2. The streptococcus and the pneumo-coccus are those commonly found; the staphylococci are rarely seen at this time and almost always associated with other forms.

3. At the end of a variable time a secondary infection occurs and gradually displaces the primary one.

4. This secondary infection is due to the staphylococcus, especially *s. albus*. This micro-organism was met with in ninety-two out of one hundred cases of otorrhœa of long standing, and almost always isolated.

5. It determines the passage from the acute to the chronic otitis media, and the constant influx of staphylococci maintains this chronicity.

6. They may enter by the Eustachian tube but their more probable course is from the external meatus through the perforations in the drumhead.

7. They are found in the cerumen, and may, therefore, exist in the canal before the disease develops.

8. They are commonly introduced on dressings which have not been sterilized, especially on absorbent cotton.

9. The authors have been able to demonstrate almost invariably the staphylococcus albus on the tampons, etc., of cotton. The habit of rolling with the fingers the cotton which is inserted into the meatus is the usual method of producing the secondary injection.

10. The surest way of preventing chronicity is to observe the strictest antiseptic and aseptic precautions.

11. These comprise three points: asepsis of nose, naso-pharynx and mouth, asepsis of the auditory canal, asepsis of instruments and dressings, especially of the absorbent cotton. These tampons may be sterilized and prepared in advance, but

12. The authors have devised a new and simple method for the sterilization of cotton—a spirit lamp and a bottle of a saturated solution of boric acid in alcohol. This method is based upon the properties of boric acid as an ignifuge. It consists in soaking the armed cotton carrier in the boric-alcohol and holding it in the flame for five seconds. It is sterilized in a few seconds without being changed in any way and without losing its absorbent quality.

OPERATIONS ON THE MASTOID APOPHYSIS.

Broca, (*Annales des mal de l'oreille*, etc., Jan., 1895). Broca describes the three methods of operation practiced by him: 1. Trepanation of the apophysis. 2. Trepanation of apophysis and tympanic cavity. 3. The operation of Stacke, which he is particular to exactly describe and differentiate from (2).

A good deal of attention is devoted to a condemnation of Wilde's incision from which fact one might conclude that it is done, more frequently than is right, in France as in some countries nearer home.

In detailing the indications for the various operations Broca mentions that he only rarely opens mastoid and middle ear in acute cases, but considers it the operation to be chosen in chronic cases. While Stacke's operation is indicated in rebellious suppurations of the attic, Broca agrees with the majority of aural surgeons that cases in which the simple Stacke operation is sufficient, are exceptional.

The ninety-nine briefly told case histories are arranged under five heads:

1. Non-suppurative, eburnating, painful osteitis.
2. Acute suppurative otitis, complicated with mastoiditis.
3. Chronic suppurative otitis, with mastoid abscess or fistula.
4. Suppurations of attic, without clinically appreciable mastoid lesion.
5. Foreign bodies in the tympanic cavity.

EXTENSIVE PERFORATIONS OF THE BONY
SEPTUM.¹BY D. BRYSON DELAVAN, M. D.,
OF NEW YORK.PROFESSOR OF LARYNGOLOGY AND RHINOLOGY NEW YORK POLYCLINIC;
CONSULTING LARYNGOLOGIST TO THE NEW YORK CANCER HOSPITAL.

PERFORATIONS of the nasal septum, situated near the posterior edge of the cartilage of the septum, and of not too great a size, are seldom of any serious pathological importance. There is a class of perforations, however, which up to the present time, have been allowed to pass almost unnoticed, but which in the opinion of the writer is deserving of attention. I refer to the more or less extensive injuries sometimes made in the course of operations upon the septum and involving a loss of substance in the vomer. Such an accident is apt to occur from the attempted removal by means of the saw of what appears to be a septal spur or ridge, but which, in reality, is a sharp horizontal deflection of an unusually thin septum. Instead of a ridge being removed, a long narrow opening, parallel with the floor of the nose, is made between the two nasal cavities. In several cases which have come under the observation of the writer in which this accident has occurred, the patient has suffered marked symptoms of general shock, quite out of proportion to the apparent importance of the injury. In one case at least there occurred reflex phenomena of such unusual interest as to warrant their being placed on record:

R. D. W., during boyhood, suffered a severe fracture of the nose, as a result of which one nasal cavity was entirely occluded by a long, almost horizontal ridge, the latter being caused by a sharp bending upon itself of the posterior part of the septal cartilage and the anterior half of the vomer. In removing this ridge an opening was made, chiefly through the vomer, about three-quarters of an inch in length and three-eighths of an inch in its

¹ Read before the Laryngological Section of the New York Academy of Medicine, November 28, 1894.

perpendicular diameter. Within twenty-four hours after the operation marked mydriasis of the right eye appeared. Twelve days later, the mydriasis having continued, the patient was seen by Dr. Richard H. Derby who found complete paralysis of accommodation of the right eye, the pupil of which was dilated *ad. maximum*. Patient made slow improvement under treatment, and it was several months before the normal condition of the eye was completely re-established.

The above case, with one other, are the only instances in which, to my knowledge, I have ever unintentionally perforated the septum. Both patients were men of spare build and nervous temperament. In the second case no localized reflex phenomena presented themselves, but the patient suffered unduly from shock, and believed himself to have been distinctly injured by the operation. I have seen three cases operated upon by others, in which similar injuries have been followed by severe and long-continued nervous irritation.

Theoretically speaking there is very little of anatomical importance in this part of the septum, except the nerve-supply. The lower artery of the septum by which this region is supplied is not likely to be injured in any of its large branches, and the loss of some of these should be readily made up for by other neighboring vessels. With the nerves, however, the case is different, for this location is precisely in the track of the fibers of the naso-palatine nerves, and even in the eye, although the connection of the latter organ with Meckel's ganglion through the medium of the few delicate filaments which constitute the ascending branches is apparently not very intimate, the possibility of reflex phenomena may be understood. The fact remains, moreover, that perforating injury to the septum in this region, in my experience, has sometimes been followed by severe disturbance.

THE APPLICATION OF THE GALVANO-CAUTERY
IN THE NASAL PASSAGES.BY J. W. GLEITSMANN, M. D.,
OF NEW YORK.PROFESSOR OF LARYNGOLOGY AND RHINOLOGY AT THE NEW YORK POLY-
CLINIC, LARYNGOLOGIST TO THE GERMAN HOSPITAL
AND DISPENSARY, ETC.

IN this communication the writer proposes to speak of two methods only of applying the galvano-cautery in the nasal passages, viz., the galvano-cautery snare and the galvano-caustic destruction of inferior turbinated hypertrophy.

P. Heymann said, in the July number of the *Berliner Telinik*, 1893, that the use of the galvano-cautery snare had constantly decreased in the last few years, and that most operators now preferred the cold snare—an assertion with which the writer cannot agree. The advantages of the galvano-cautery snare, first recommended by Voltolini for operation of nasal polypi,¹ are the thorough severance of the tissue grasped, the avoidance of bleeding and the simultaneous cauterization of the remaining stump. Heymann maintains, that although considerable force might be necessary sometimes, he can always cut through dense tissue with a fine, cold wire, moreover some cases of bleeding have been observed after use of the hot snare, and he objects to the latter, as the eschar formed obstructs the field of vision and hides the smaller growths when present.

The first objection is not valid, as the hot snare cuts easier through the tissue than the cold one, and the observation of an eschar interfering with completing the operation has never occurred in the writer's practice, extending over a large number of cases. But the chief advantage of the galvano-cautery snare is the absence of the small amount of bleeding during removal of polypi. The few exceptions quoted by Heymann do not speak

¹ Voltolini. *Die Anwendung der Galvano-caustile*, second edition, Vienna, 1872, W. Braumueller, p. 242.

against a method, which as a rule not only saves the patient loss of blood, but by which also for this very reason the operation can be performed quicker and more completely, than when we have to tampon the nose and to wait till the bleeding has ceased.

For removal of nasal polypi and in fact for all operations requiring the employment of a snare the writer has for years past discarded the platinum wire and made use of a wire made of an alloy of platinum and iridium. It was originally devised for removal of posterior inferior turbinated hypertrophies,² for which it has always proved an invaluable acquisition in the writer's hand, as it not only reduces the time of the operation to a few minutes, but accomplishes the desired result with scarcely any loss of blood, if the current is occasionally interrupted before complete severance. The iridium being very brittle, imparts elasticity and resiliency to the wire, preventing its bending, and allowing it to resume its given curve when released, as *e. g.* in the rhinopharynx. The percentage of iridium in this alloy necessarily being small, it required several years experimenting to obtain a suitable wire. After trying several factories and also wire imported from Paris, where it is being made since 1890, a percentage of from 5 to 10 per cent has been determined upon as the proper kind, although if desired, a wire of higher percentage (20%) can be obtained. Wire of 27 American standard gauge has been found most serviceable, and its low price—45 cents net per linear foot furnished by Tiemann & Co., of this city—puts it within the reach of all operators who wish to test its merits. Irido-platinum wire is already used by a number of operators, amongst them Dr. R. P. Lincoln, who recently removed with it a large naso-pharyngeal tumor.³

Three years ago the writer advocated in these ANNALS the use of trichloracetic acid after galvano-cautery application to the nose,⁴ as a means of lessening the subsequent reaction. This method was severely criticized soon after its publication, making a reply almost imperative. A circular letter was addressed to forty-seven prominent rhinologists, asking their experience as to the after effect of the galvano-cautery, to which the majority very kindly replied. Circumstances beyond the control of the writer prevented the compilation of these replies at the time, and it is doubtful if the views expressed, dating about three years back,

² *Medical Record*, March 17, 1888, p. 315.

³ *New York Medical Journal*, May 26, 1894, p. 653.

⁴ ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY, January, 1892.

would give the opinion of the contributors held now correctly. But it may be briefly stated that a great difference of opinion was revealed. A few did not use the galvano-cautery, a number of others always cauterized a small area only, the majority employed after treatment, some sprays, some the dry plan, strongly abrogating the spray, a few plugged the nose with different material. The larger number had reaction of milder or severer type, two had already used trichloracetic acid and with satisfaction.

The publication of these reports and the deductions therefrom having once been deferred, it was deemed best to leave it to time to decide the usefulness of the method. Soon favorable communications were received in print as well as were made verbally to the writer, a few of which will be quoted here. The first approval appeared in remarks made during the discussion of a paper read by Dr. De Blois before the American Laryngological Association, June, 1892, when two members spoke very highly of the use of the acid,⁵ one stating that: "The results have been excellent, it lessens the inflammatory reaction and promotes healing of the parts." A similar opinion expressed by Dr. Würdemann⁶ saying: "The resulting eschar is firmly adherent and dry, and as a rule there is no reaction." The same author reiterated and emphasized this statement later on, and wrote:⁷ "In some thousands of applications I have yet to learn of reactive inflammation or erysipelas following its use. * * * In several instances where I have neglected its use I have had reactive inflammation; * * * but have always had uniform rapid healing where it has been applied." Equally satisfactory views and results, based on wide experience, are given by Dr. Stein, of Moscow,⁸ and the well-known European laryngologist, Prof. Moritz Schmidt, in his latest treatise on diseases of the upper air passages.⁹ The latter recommends the use of a weak borococain spray after the cauterization, which the writer has adopted since and has found to be very beneficial to the patient.

The writer has not felt called upon to modify his method published three years ago, except in some minor details. Although the percentage of unpleasant reactions is insignificantly small and grows smaller every year; occasionally cases do occur in which

⁵ Transactions of the American Laryngological Association, 1892, p. 97.

⁶ ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY, July, 1892, p. 190.

⁷ *Journal of American Medical Asso.*, May 25, 1894, p. 740.

⁸ *Monatsschrift für Ohrenheilkunde*, January, 1894, p. 4.

⁹ Berlin, Julius Springer, 1894, p. 199.

swelling of, or discharge from, the cauterized wound is observed. The endeavor to find the underlying cause for the exceptions led to investigations in different directions, *e. g.* as to the constitution, temperament of the patient, plethoric condition, local hyperemia, density and degree of the hypertrophied tissues, but so far without any positive result. But one etiological factor has been found, which, when present, favors reaction in the majority of cases, viz., bleeding produced by the galvano-cautery application. The reason probably is that the blood oozing from the cautery wound liquifies and washes away the trichloracetic acid and prevents the promotion of a dry eschar. Although the writer is strenuously opposed to such frequent cautery applications as he has seen made, six to eight times to one turbinated, and although he always tries to accomplish the necessary reduction with one operation, the cautery applications were made with greater care and precaution when there was any reason to expect bleeding. The borcocain spray—1 to 500 to 1000—has, as stated before, materially assisted the desired result.

46 East Twenty-fifth Street.

A CASE OF FIBROMA OF THE NASAL FOSSA.¹

BY CHARLES H. KNIGHT, M. D.,
OF NEW YORK.

TUMORS of the nasal fossa made up in part of fibrous tissue are not uncommon, many cases of fibro-sarcoma and of fibro-myxoma being on record. Fibromata of the naso-pharynx are much more frequent. The explanation of this fact, generally accepted, is that the deep layer of fibrous tissue is denser and more plentiful at the upper and posterior parts of the nasal chambers and in the vault of the pharynx, than elsewhere in the upper air tract.

In a paper read at the Ninth International Medical Congress in 1887, Casselberry tabulated eight cases of intra-nasal tumor, in three of which, including one of his own, the diagnosis of fibroma was verified by the microscope. One was a fibro-sarcoma, one a fibro-myxoma, and the remaining three were designated fibromata, although no microscopic examination was made. In one of these last death resulted from hemorrhage following an attempt at removal of the tumor, a fact which would tend to throw suspicion on the diagnosis.

By many observers, vascularity is said to be a characteristic of a fibroma and epistaxis is mentioned as an early and constant clinical sign. A careful study of Bosworth's collection of forty-one cases of so-called fibroma would justify the exclusion of a large proportion of them. Hemorrhage, as a frequent occurrence, or in excess, is always suggestive of malignancy. Whatever may be the rule as to the naso-pharynx it is believed that pure fibromata of the nasal fossa, especially if pedunculated, are not dangerously vascular growths.

Since the date of this report a single case of fibroma has been recorded, that exhibited by Gerber, January 8, 1894, and referred to in the *Journal of Laryngology*, April, 1894. In 1893 Stoker gave the history of a case of what he calls "soft fibromata," vascular papillary growths of the middle and inferior turbinated bodies, evidently not genuine fibrous tumors. A similar case of "soft fibroma" of the nasal septum has been reported by Victor

¹ Read before the Section in Laryngology of the New York Academy of Medicine.

Lange, and is abstracted in the *Journal of Laryngology*, February, 1894.

The history of my own case is as follows: G. T. D., 21 years of age, came to me in 1889 with the usual symptoms of nasal catarrh which had been present for several years. The left nostril in particular was obstructed. There was no pain. The sense of smell was not impaired. There had never been any hemorrhage. The general health was excellent, except for a persistent cough with moderate expectoration which led the patient to apprehend pulmonary disease. The lungs, however, were sound. On anterior rhinoscopy the septum was seen to be somewhat deflected to the left, and far back in the left nasal fossa could be detected a smooth, movable tumor attached to the posterior end of the middle turbinated body. In the rhinoscopic mirror the tumor appeared nearly to fill the left choana. It was smooth, round and symmetrical, and decidedly darker in color than the average edematous polyp, and, moreover, was evidently denser in structure. Nevertheless, it was thought to be an ordinary gelatinous growth containing an unusual proportion of fibrous tissue.

The removal of the tumor was easily accomplished under cocain, by means of the cold wire snare, and was followed, of course, by great relief as regards the breathing, and by considerable improvement in the general catarrhal symptoms. The after-treatment consisted in the use of sprays, cleansing and sedative in character, and the reduction of turbinated hypertrophies with the galvano-cautery. There has been no recurrence of the growth.

The chief interest of this case centers in the microscopic character of the tumor which is a *pure fibroma*. Several sections have been examined by my friend Dr. Jonathan Wright, who reports that he has been unable to find the slightest trace of so-called myxomatous structure. I am able to show only a remnant of the neoplasm which, however, gives an idea of its dimensions. The micro-photograph exhibits the density and absence of vascularity in the growth, and shows near the surface at certain points, collections of small round cells suggestive of sarcoma. In general the fibrous structure is perfectly distinct, and becomes more marked towards the middle of the tumor.

Since the presentation of this report a case of nasal fibroma has been published in the *Charlotte Medical Journal*, January, 1895, by Dr. W. H. Wakefield. It does not appear that the diagnosis was confirmed by the microscope, and the precise implantation of the tumor remains in some doubt, its point of attachment not having been determined before its removal.

147 West Fifty-Seventh Street.

A FEW MODIFICATIONS IN THE OPERATING PROCESS OF ADENOID TUMORS.

By A. A. FOUCHER, M. D.

PROFESSOR OF CLINICAL OPHTHALMOLOGY AND OTOLGY AT LAVAL
UNIVERSITY OF MONTREAL.

THE question of adenoid tumors, is no novel one in the domain of medical literature. There is, nevertheless, it seems, in the same field, ample scope for a more minute exploration, if not on the ground of their diagnosis, prognosis, and pathological anatomy, at least on that of their treatment.

We will enter upon the subject immediately, and state that any process of operation tending to diminish the danger, the length of the operation, and secure the total removal of the adenoid growths in one sitting; in short, to reduce to its lowest terms both for the patient and the doctor, all that the operation demands, requires consideration. Such is the result obtained, we believe, by using

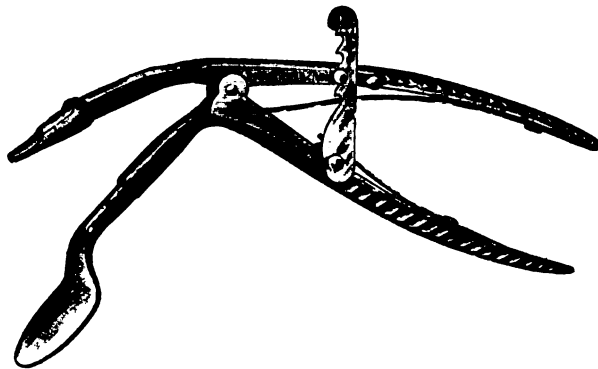


FIG. 1.

a combined mouth-gag and tongue depressor of a new model, (Fig. 1) and by modifying Higguet-Munger's curette as represented in Fig. 2.

The tongue depressor and mouth-gag we present, furnishes simultaneously, the quickest and easiest way to obtain both the desired opening of the mouth and the depression of the tongue. To seek the same end with two distinct instruments implies a loss of time and an unnecessary complication of the operation.

The tongue depressor, if made use of, alone renders one liable to several inconveniences; the patient only half opens his mouth, moves his tongue so that the instrument is displaced and sometimes even thrust out of the mouth, or moreover, as it has often happened to us, the patient completely closes his mouth as soon as the instrument has reached the posterior part of the velum palatinum. These difficulties cause at least a delay in the operation and by no means do they facilitate or enhance it for the doctor.

If beforehand, anything whatsoever be inserted between the teeth in order to secure an opening, no matter how small, the combined mouth-gag and tongue depressor can be introduced and



FIG. 2.

the mouth instantly opened, in fact, it is sooner done than said and the way is made clear for the operator.

If the jaws are closed, all that is required is a slight opening for the insertion of the thin blade of the tongue depressor which, as it works its way in, opens the mouth, the teeth gradually coming in contact with the part forming the gag.

The curette is modified, as to the shape of the annular knife and as to the direction to be given to the handle of the instrument.

The straight handle, metallic or otherwise, is defective because the hand cannot grasp it firmly enough; it slips, turns around according to its greater axis, and causes the operator to carry the edged ring where he does not intend.

We operated without anesthesia, (it being the express desire of the father), on a very unaccommodating patient, a boy, 16 years of

age, large and strong, who would not open his mouth. With the aid of two assistants and a straight jacket that kept the patient tied to the chair, he was mastered and placed in a proper position for the operation, but still the battle was not won.

The ceremony of the opening of the mouth was a signal for a desperate fight. The patient persisting in his obstinacy, force and dexterity had to be used and were finally crowned with success.

Unfortunately, during the struggle, a few decayed teeth were broken, and the patient now deprived of every apparent mode of defense resorted to the secretions of his salivary glands to quench his unabated rage. Instantly both operators and assistants were covered with spittle and struck with the debris of the broken teeth, which were the least unpleasant of the projectiles.

Notwithstanding this volley of a new description, Gottstein's curette was boldly thrust towards the pharynx. Meanwhile, the ordinary tongue depressor did not remain in place, and finally, as the curette was on the point of surmounting the contraction of the velum palatinum and that the long desired and dearly fought for object was to be attained, another difficulty presented itself; the handle of the instrument was so covered with blood and saliva that it was impossible to keep hold of it and to manipulate it in a proper way.

The operation, however, was brought to an end. It was rather incomplete than otherwise, and it is useless to add that the patient did not give us a second chance to judge its results.

There is no doubt that the experience just related has occurred elsewhere also, for modifications were evidently made in the shape of the handle of the curette, in order to furnish the hand with a better grasp.

Nevertheless any such modifications heretofore introduced seem inadequate and remain inferior to that we present, a modification that has stood the test of two year's experience and given entire satisfaction.

As can be seen by the accompanying illustration our instrument is bent at right angle, the handle rests entirely in the hand when closed, the thumb being placed at the end of the branch that bears the ring, prevents any lateral movement and helps to direct the instrument according to will.

Another important improvement we thought fit to make in Higuet-Munger's curette, has been the suppression of its projecting acute inside part, which has the grave inconvenience of penetrating into the mucous membrane, and tearing it to a great extent.

The notch in the curette seemingly offers the advantage of setting the instrument towards the fornix of the pharynx, using the free margin of the post-nasal partition as a guide.

The few modifications just alluded to, have been attended, in our practice, with success, in the rapid, easy and efficacious treatment of adenoid tumors.

SEMIFLUID PRÉPARATIONS FOR NASAL USE.

BY WALTER F. CHAPPELL, M. D.,
OF NEW YORK.

SURGEON TO THE MANHATTAN EYE, EAR AND THROAT HOSPITAL.

A SYSTEM of routine treatment is apt to be employed in affections which are more or less chronic in character; and especially is this true in diseases of the nasal cavity which are accompanied by either an hypertrophic or atrophic condition of the mucous membrane.

The application of medicines by the douche and spray has been a favorite routine method of treatment in nasal affections and they have met most of the indications. The necessarily fluid character of these solutions has diminished their usefulness to some extent, as they remain in contact with the mucous linings such a short period that the fullest benefits of the application cannot be realized.

When, therefore, a more or less constant application of a remedy is required, we must look for solutions which are very tenacious in character. The ointments and oils of the pharmacopeia can scarcely be utilized for this purpose, as one is too thin and the other too thick to be used with advantage.

During the past two⁷/₂ years I have used in private and hospital practice a combination of zinc ointment and sterilized castor oil with hydro-carbon oil in the proportion of from half a drachm to two drachms of the zinc and castor oil to one ounce of hydro-carbon oil. This combination is called at the Manhattan Hospital oleum hydro-carbon compound, and is kept in stock solution as a base to which other remedies can be added as the nature of the case may indicate.

The solution has a white creamy appearance and is very tenacious. When applied to mucous surfaces it clings for several days to the openings of the mucous glands, and to any abrasions or spots of ulceration which may be present

In deciding what drug should be added to the stock solution, the nature of the affection must be considered. If it is acute in character, with considerable discharge, astringents or sedatives are indicated. If the affection is chronic the selection will depend on the presence or absence of nasal discharge. Much latitude must be allowed for individual preference in choosing remedies. In the primary stages of acute rhinitis, the writer has found the following prescriptions of great benefit:

R_x

Acidi tannici	gr. v.
Acidi borici	gr. x.
Cocain hydrochlor.	gr. i.
Olei hydrocarb. co.	℥i.

M. Sig.—Warm and use in the nostrils every four hours.

R_x

Camphoræ	
Mentholi $\overline{a a}$	gr. v.
M.—Rub together, et adde	
Olei hydrocarb. co.	℥i.

M. Sig.—Use every four hours.

Either of these prescriptions will lessen the profuse irritating nasal discharge, and diminish the hypersensitive condition of the mucous membrane in a marked degree. In cases of hypertrophic rhinitis the treatment will depend on the form of the disease. If the hypertrophy is accompanied by considerable thick yellow discharge, tannic acid, five to fifteen grains to the ounce of the stock solution proves very satisfactory. If the discharge is watery, boric acid should take the place of tannic acid, if there is no secretion, and the membrane is puffed up and red, a soothing application such as liquor plumbi subacetatis is indicated.

Cases of atrophic rhinitis improve very much when treated by the application to the membrane of compound hydrocarbon oil with the addition of iodine crystals (four grains to the ounce) or one of the mercury ointments. The daily application of these oily solutions prevents the formation of dry crusts, and the stimulating properties of the iodine and mercury have a marked effect on any remaining glandular tissue. A preparation containing boric and carbolic acid makes an excellent dressing after operations on the septum, or after the use of the cautery or any caustic to the turbinated bodies. It keeps the parts clean and assists cicatrization.

Epistaxis, due to small cracks, abrasions or ulcerations, is relieved promptly if the oily preparations are used. The treatment should

be started between the attacks as it prevents the formation of crusts, the efforts to remove which frequently start a nose bleed.

The application of semifluid preparations causes so little discomfort that patients readily continue the treatment as long as required. For the same reason they are of special value in the nasal affections of children. These solutions may be painted over the interior of the nasal fossæ with a camel's hair brush or injected with a soft rubber syringe or dropper. They may also be poured from the tip of a small teaspoon into either nostril. If the head is tilted backwards, holding one nostril and taking a deep inspiration through the other, distributes the fluid pretty evenly over the interior of the nasal cavity. About ten drops is sufficient for each nostril, but if we wish to reach the posterior pharyngeal wall, or larynx, a larger quantity will be necessary. The application should then be made just before going to bed; it flows slowly backward during the night, and in the morning may still be seen adhering to the mucous membrane of the naso-pharynx, pharynx and larynx.

22 East Forty-Second Street.

FOREIGN BODIES IN THE EAR AND NOSE.

BY M. D. LEDERMAN, M. D.,
OF NEW YORK.

LECTURER ON DISEASES OF THE NOSE AND THROAT, NEW YORK POLY-
CLINIC; ATTENDING AURAL SURGEON TO THE UNIVERSITY
MEDICAL COLLEGE DISPENSARY; ASSISTANT
SURGEON TO THE MANHATTAN
EYE AND EAR HOSPITAL.

WHEN we consider the frequency with which children are permitted to entertain themselves with whatever object may come within their reach, it is but natural that these accidents should be peculiar to child life. Yet among a series of cases herewith reported, three similar instances (two of which were involuntary) occurred in adults.

As the nostril and external openings of the auditory canals are the most accessible hiding places for such substances, they consequently become the repositories of anything not too voluminous. It is, therefore, not surprising to find almost any diminutive article in these cavities. Usually the introduction of a foreign element is brought to the attention of the parent by the restlessness of the young one, or by obvious symptoms referable to the seat of the trouble. If such proves to be the case, the family physician is consulted, and often his dexterity permits the successful extraction of the missing body. At times, however, the absence of necessary instruments prompts him to refer the patient to the specialist. Not infrequently, repeated attempts at the removal of the article are made before the case comes under our care, and the resulting tumefaction makes the procedure a difficult and painful matter. Occasionally the parents do not know that their child has introduced a foreign substance into the nose or ear, and they become enlightened only after same has been discovered and extracted. Simple means usually suffice, but there are a few cases of "foreign body in the ear" reported where a major operation had to be performed (separation of the auricle from its attachment and reflected anteriorly), before the extraneous matter could be

withdrawn. Bearing in mind the unpleasant sequela which may result from faulty manipulation in trying to effect the desired result, we should bring to our aid the method which admits of such an action with the minimum degree of traumatism.

In a case which I published last year,¹ symptoms had existed for three months without the mother being aware of the origin of the little girl's affection. Incessant scratching of the nose was observed by the parent, but she thought that this habit diagnosed "worms." Unilateral nasal discharge with an eczema of the upper lip were pronounced symptoms. The family physician treated the condition as purulent rhinitis until a suppurative otitis ensued, when the case was referred to me. Recalling the frequency with which an excessive one-sided nasal secretion in children is associated with foreign body, an inspection of the nares followed, and some obstruction could be detected in the left middle meatus. Could not, however, appreciate the nature of the substance. Syringing through the unobstructed side with head bent forwards, succeeded in releasing an impacted coffee bean. The mother then remembered that her young daughter was in the habit of playing with these beans. Two days after the expulsion of the exciting cause, the aural discharge ceased, demonstrating the deleterious influence pathological changes in the nasal chambers exert upon adjacent structures.

Case I. S. B., 5 years of age, mother stated that the boy had a "bloody flow" from the left side of his nose for about five weeks. She noticed that the outside of the nose was considerably swollen, and when the part was touched the child cried bitterly. He was very restless at night and constantly rubbed his nose. Some one had told her that the boy had catarrh. An examination found upper lip and wing of nose excoriated, with a collection of purulent secretions occupying the left cavity. After cleansing the latter, a shoe button was discovered, with the eyelet pointing anteriorly, situated about three-quarters of an inch from the external orifice, between the septum and inferior turbinated body. This was readily removed by means of a small double tenaculum angular forceps, which nicely grasped the presenting eyelet. The offensive discharge stopped a few days later, under a mild anti-septic spray.

Case II. H. S., 4 years of age, male, was brought to my office on account of a continuous "yellowish discharge" from the right nostril. Mother was not aware of any foreign body having been put into the nose by the little patient. The "running of the nose" had existed for about three weeks before she consulted me.

¹Suppuration of the middle ear, etc., *Med. Record*, April 14, 1894.

No signs of pain were observed, but as in the other instances, the finger was frequently introduced into the nostril. Inspection revealed occlusion of the right nasal chamber by a mass of mucopus. Removing same by means of a cotton wrapped applicator, a piece of "sugar string" was found to be the source of irritation. It was conveniently grasped with the knee-forceps, and measured about four inches. The boy had evidently pushed this plaything into his nose, and was not able to get it out. Three days later the nose was in its normal condition.

We occasionally meet with similar accidents, in which prolonged and futile attempts at extraction generate considerable congestion and swelling of the nasal mucous membrane and erectile tissue. In these cases, a spray or application of cocain solution will materially assist in simplifying matters, by its anesthetic and contracting properties. In the auditory meatus, however, cocain has but little effect in reducing the tumefaction, and consequently if the substance has become impacted it is advisable to give a general anesthetic. Usually a few whiffs of chloroform will answer the purpose. We rarely meet with such complications in the adult, as they quickly seek professional assistance, if such an accident should happen. Even though the foreign article is not surrounded by swelling of the soft parts, it is judicious to administer an anesthetic to restless children, to avoid the liability of causing further traumatism.

Case III. H. E., male, 20 years of age, consulted me on account of a peculiar noise in his left ear, which came on suddenly during the morning of his visit, as he arose. Never had any difficulty with his ear before, and was much annoyed at the strange symptom. He had taken no medicine for a long period, and was feeling in the best of health. The tinnitus was intense at times, but then ceased abruptly. Hearing was excellent. On examining the left ear, I noticed a small black spot about the size of a pin's head, just below the umbo. On attempting to brush same aside with the cotton-wrapped applicator, this spot showed signs of animation, and traveled towards the anterior periphery of the memb. tymp. Immediately the patient remarked that the noise had again returned. As soon as the "bedbug" (for such the anomaly proved to be) was quiet the noise ceased. Douching with a carbolic solution failed to dislodge the intruder: but a pair of aural knee-forceps accomplished the purpose.

Case IV. Was much like case III, except that the diminutive specimen belonged to the cockroach family, and was found dead in the auditory canal of a woman, 45 years of age. There had been some tinnitus for a few days, but it had stopped suddenly, and patient came to one of my clinics to be treated for a fullness which existed in the ear. The corpse was removed with the ordinary ear forceps.

Case V. J. G., 21 years of age, presented herself at my clinic at the Manhattan Eye and Ear Hospital, stating that the night previous to her visit she had attended a theatrical performance during which there was a repeated discharge of firearms. Being of a nervous disposition she placed some silver foil (which had been wrapped around bonbons) into her ears, to avoid hearing the sudden explosions. At the end of the drama she succeeded in removing the obstruction from the right ear, but accidentally pushed the left one further into the canal, and could not reach it. Hearing was naturally lowered, but conversation was appreciated as usual. No tinnitus existed; the silver foil was easily rolled out of the meatus by means of a dull ring-curette.

Case VI. C. A., female, 3 years of age, came to the same institution with her mother, who informed me that there was a small bead in the little girl's right ear, as she had seen the child put it there. Examination substantiated the parent's statement, and the bead was withdrawn from its position against the memb. tym. with the aid of the dull ring-curette. Some myringitis was present, but this passed away in two days.

Case VII. Male, 4 years of age, was in the habit of playing with yellow corn. He swallowed a seed occasionally, for which action he received corporal punishment. This time he stuck a grain into his right ear, and the mother's ingenuity did not succeed in abstracting same. The corn was observed close to the Mt., the longest diameter being antero-posteriorly. No difficulty experienced in catching hold of same with a pair of mouse-toothed forceps.

Case VIII. J. H., 10 years of age, male, was playing with some of his friends around a pebble mound. In trying to see how far a pebble would go into his ear it became lodged in the right canal. Mother came to the Manhattan Eye and Ear Hospital with the boy, where I removed the stone under ether with the dull ring-curette. It was larger than a good-sized cherry stone.

Case IX. C. J., 12 years of age, male, was referred to the same clinic by the family physician. The boy had introduced a coffee bean into his right ear two days before his visit, and though the attending physician had repeatedly tried to extract it, the bean resisted his tactics. An inspection revealed the soft tissues of the canal greatly swollen and very painful. The source of the discomfort could be plainly seen jammed against the drum, which was obviously inflamed. As the pressure of the speculum was quite painful, ether was administered. At the previous attempts a piece of the bean had been broken off, and it was only after I had succeeded in crushing the remaining portion, which was imbedded in the lacerated structures, that same could be removed. Suppuration was anticipated and resulted, though antiseptic precautions had been observed. Under daily applications of hydrogen peroxid, this condition ended on the fifth day.

Among the numerous instruments suggested for the removal of foreign bodies from the ear and nose, the dull ring-curette, small mouse-toothed forceps and aural syringe are probably the most simple and useful. In the majority of aural cases the ring-curette will prove to be the instrument *par excellence*. We must consider the chemical properties of the object to be extracted, for syringing, though generally a harmless and excellent agent, may strikingly augment the existing difficulty if applied to bodies of a hydropic nature. Gentle maneuvering will frequently succeed, while heroic measures may not alone prove futile, but may give rise to undesirable consequences. If the foreign body happens to be a member of the animal kingdom, a little chloroform dropped into the canal may quickly end its existence, after which its removal is an easy matter.

128 East Sixtieth street.

THE USE OF LOCAL APPLICATIONS OF GUAIACOL
IN DISEASES OF THE THROAT.BY HAL FOSTER, M. D.,
OF KANSAS CITY, MO.

THE preparations of guaiacol have been used for sometime in pulmonary diseases, especially phthisis. There can be no question that this drug acts on the germs, reduces the temperature and proves a source of satisfaction to the physician by giving marked results. The carbonate has been used more extensively internally, given in capsules or in milk. During the last year many laryngologists have used the solution of guaiacol topically to acute affections of the throat with good results. For several months I have been using a solution of pure guaiacol, locally for acute tonsillitis. I have applied the solution of pure guaiacol by means of cotton on the ordinary throat applicator. As a rule, the drug causes a burning sensation for a few moments after being applied to the tonsils. I have also used it in ulcers of the larynx caused by tuberculosis; in each case it has acted well and has enabled my patients to swallow food without pain. In these cases of tuberculosis of the larynx the carbonate of guaiacol in capsules or milk has been used internally as well. In using the pure solution to the throat it is necessary to exercise great care in order that none of the drug should get into the larynx.

If the applicator armed with cotton is thoroughly saturated and gently touched against the mouth of the bottle before making the application to the throat there will be no danger of getting any of the drug into the larynx. It can be used in oil of almond as a spray in any strength the physician may elect. In my experience the direct applications to the throat have been much more satisfactory in every way. I have also used it with some satisfaction in acute pharyngitis. If the drug is used early before pus has formed in the tonsils many cases of tonsillitis can be aborted and much pain and discomfort spared the patient.

PROFESSIONAL NEWS.

AMERICAN MEDICAL ASSOCIATION,

SECTION ON OPHTHALMOLOGY,

MEETS IN BALTIMORE, MAY 7-10, 1895.

OFFICERS OF SECTION:

Edward Jackson, Philadelphia, Pa., Chairman.

H. V. Würdemann, Milwaukee, Wis., Secretary.

Executive Committee; J. L. Thompson, Indianapolis, Ind.;
S. D. Risley, Philadelphia, Pa.; A. R. Baker, Cleveland, O.

The limits of time allotted are ten minutes for the reading of a paper, and five minutes for remarks in discussion.

The annual dinner of the Section will take place on Tuesday evening; (price, \$2). Those who expect to be present are requested to notify Dr. Hiram Woods, 816 Park avenue, Baltimore, Md.

The volume of Transactions of the Section will be forwarded to all who will send the Secretary \$1, with their address.

PROGRAM—TUESDAY, 3 P. M.

1. Address of Chairman. The strength of the different mydriatics and myotics. Edward Jackson, Philadelphia, Pa.
2. Incipient cataract. A. R. Baker, Cleveland, O.
3. Operative treatment of immature and some forms of zonular cataract. J. E. Weeks, New York. N. Y.
4. The operation for secondary cataract. J. H. Thompson, Kansas City.
Discussion to be opened by Boerne Bettman, Chicago, Ill.; J. A. White, Richmond, Va.; Geo. E. Frothingham, Detroit, Mich., and Herman Knapp, New York.
5. Practical points in anesthesia for plastic operations about the eye. M. W. Zimmerman, Philadelphia, Pa.
6. The restoration of the eyelids with sliding flaps. W. C. Tyree, Kansas City, Mo.
7. Blepharoplasty without pedicle. Eugene Smith, Detroit, Mich.
8. Transplantation of skin in plastic operations on the eyelids. Walter B. Johnson, Paterson, N. J.
9. Skin grafting in ectropium and entropium. F. C. Hotz, Chicago, Ill.
10. Transplantation of a strip of skin into the intermarginal space of the lids. Herman Knapp, New York, N. Y.

11. Some cases of restoration of eyelids by plastic operations, with exhibition of patients. Herbert Harlan, Baltimore, Md.
Discussion opened by R. A. Reeve, Toronto, Canada, and Swan M. Burnett, Washington, D. C.

TUESDAY, 7 P. M.

Annual dinner of the Section.

WEDNESDAY, 9 A. M.

12. A new and almost bloodless enucleation operation. Boerne Bettmann, Chicago, Ill.
13. Evisceration of the eyeball. L. Webster Fox, Philadelphia, Pa.
Discussion opened by S. D. Risley and G. O. Ring, of Philadelphia, Pa.
14. Histological and bacteriological notes on some cases of penetrating wounds of the eyeball, with experimental observations on certain bacilli found in a case of post-operative panophthalmitis. G. E. de Schweinitz, Philadelphia, Pa.
Discussion opened by R. E. Randolph, Baltimore, and H. Gifford, Omaha.
15. A clinical study of the ulcerative diseases of the cornea. S. D. Risley, Philadelphia, Pa.
Discussion opened by C. J. Kipp, Newark, N. J.
16. Hemorrhage into the retina and vitreous in young persons, associated with evident disease of the retinal blood vessels; remarks on the formation of vessels into the vitreous and in a case of emigrating subhyaloid hemorrhage. Harry Friedenwald, Baltimore, Md.
17. Prognostic significance of albuminuric retinitis. E. Oliver Belt, Washington, D. C.
18. Extensive colloid changes in the choroid, with report of cases. J. T. Carpenter, Jr., Philadelphia.
Discussion opened by G. E. de Schweinitz, Philadelphia, and R. W. Gillman, of Detroit, Mich.

WEDNESDAY, 3 P. M.

Report of Nominating Committee and election of officers.

19. Historical notes on operations on the ocular muscles. T. B. Schneideman, Philadelphia, Pa.
20. The technique of tenotomy of the ocular muscles. Leartus Connor, Detroit, Mich.
21. The slight effects sometimes produced as the result of free tenotomies of the ocular muscles for heterophoria. S. Theobald, Baltimore, Md.
22. The limitations of tenotomy of the ocular muscles. H. F. Hansell, Philadelphia, Pa.
23. Tendon advancement, with a special indication for its employment. C. H. Thomas, Philadelphia, Pa.
24. The indications for, advantages and technique of muscle shortening. G. C. Savage, Nashville, Tenn.

Discussion opened by Geo. T. Stevens, New York; J. L. Thompson, Indianapolis, and S. D. Risley, Philadelphia, Pa.

25. Strabismus. C. M. Hobby, Iowa City, Iowa.

26. To what extent should recently suggested methods of muscular exercise displace tenotomy in the treatment of heterophoria. Hiram Woods, Baltimore, Md.

27. Practical points gained in the treatment of 1,000 cases of insufficiency of ocular muscles. J. W. Park, Harrisburg, Pa.

28. Hysterical affections of the eye muscles. H. Gradle, Chicago, Ill.

29. Some remarks on paralysis of the superior rectus muscle. Ed. J. Bernstein, Baltimore, Md.

Discussion opened by J. F. Fulton, St. Paul, Minn., L. Connor, Detroit, Mich., and S. Theobald, Baltimore, Md.

THURSDAY, 9 A. M.

30. Report of committee on legislation for the prevention of blindness. Lucien Howe, Chairman, Buffalo, N. Y.

31. Some rare cases of infantile purulent conjunctivitis. A. A. Hubbell, Buffalo, N. Y.

Discussion opened by B. Alex. Randall, Philadelphia, Pa.

32. Retrobulbar tumor. S. C. Ayres, Cincinnati, O.

Discussion opened by J. A. White, Richmond, Va.

33. A case of enchondroma of the cartilage of the upper lid. P. D. Keyser, Philadelphia, Pa.

Discussion opened by F. C. Hotz, Chicago, Ill.

34. Report of a case of traumatic varix of the orbit in which ligation of the left common carotid was performed. C. A. Oliver, Philadelphia, Pa.

Discussion opened by R. A. Reeve, Toronto, Canada.

35. The infiltration method of anesthesia in ophthalmic practice with demonstrations. H. V. Würdemann, Milwaukee, Wis.

Discussion opened by Harry Friedenwald, Baltimore, Md., and Carl Koller, New York, N. Y.

THURSDAY, 3 P. M.

36. Report of committee on the examination and care of the eyes during school life. B. A. Randall, Chairman, Philadelphia; W. F. Southard, San Francisco; H. B. Young, Burlington, Ia.; A. R. Baker, Cleveland, and George H. Price, Nashville.

Discussion opened by Peter A. Callan, New York. James P. Parker, St. Louis, and S. D. Risley, Philadelphia.

37. Two thousand five hundred cases of ocular headache and the different states of refraction connected therewith. W. F. Mitendorf, New York.

38. A study of the refraction of 1,500 eyes. H. Bert Ellis, Los Angeles, Cal.

39. Anisometropia. W. F. Southard, San Francisco.

40. The percentage of symmetrical and asymmetrical meridians of the cornea in astigmatic eyes. S. D. Risley, Philadelphia, and J. Thorington, Philadelphia, Pa.

41. Latent astigmatism. H. M. Starkey, Chicago, Ill.
 42. On the general and local conditions that change corneal curvatures. L. J. Lautenbach, Philadelphia.
 Discussion to be opened by T. E. Murrell, St. Louis; W. H. Wilder, Chicago, and Edward Jackson, Philadelphia.

FRIDAY, 9 A. M.

43. Ectopia lentis. Flavel B. Tiffany, Kansas City, Mo.
 Discussion to be opened by Harold Gifford, Omaha, Neb.
 44. The use of prisms to increase vision in the formation of new maculæ in conical and leucomatous cornea, etc. George M. Gould, Philadelphia, Pa.
 Discussion opened by T. H. Fenton, Philadelphia.
 45. Observation upon the eye of the negro with special reference to the refraction, ocular muscles and color vision. C. W. Kollock, Charleston, S. C.
 Discussion opened by Swan M. Burnett, Washington, D. C.
 46. Ophthalmoplegia interna. B. L. Milliken, Cleveland, O.
 Discussion opened by H. V. Würdemann, Milwaukee.
 47. The relation between the eye and the brain. J. A. Lydston, Chicago, Ill.
 Discussion opened by R. E. LeMond, Denver, Colo.
 48. Anomalies in ophthalmic practice. A. C. Corr, Carlinville, Ill.
 Discussion opened by S. L. Ziegler, Philadelphia.
 49. Formalin as a preservative agent for eye specimens. W. H. Wilder, Chicago, Ill.
 Discussion to be opened by F. C. Hotz, Chicago, Ill.
 50. A new keratometer. D. S. Reynolds, Louisville, Ky.
 Discussion to be opened by Geo. H. Price, Nashville, Tenn.

This is not the complete program, and we regret that we failed to receive the additions to it in time to have them inserted, but the above is sufficient to show that the Section of Ophthalmology is the live end of the American Medical Association. The Chairman and Secretary of the Section deserve much credit for their good work. We are informed that the program of the Laryngological and Otological Section—of which Dr. J. F. Fulton, of St. Paul, is President, and Dr. F. J. Gallaher, of Pittsburgh, is Secretary—will be better than has been presented in the history of the Association.

[Ed.]

Dr. M. D. Lederman, of New York City, has removed from 1029 Park avenue to 128 East Sixtieth Street.

Dr. Julius G. Ehrhardt, late Professor of Ophthalmology and Otology in the College of Physicians and Surgeons of St. Louis, Mo., has established a private hospital, at 1418 Washington avenue, for the care and treatment of patients afflicted with diseases of the Eye and Ear.

FOR SALE.

THE PRACTICE OF AN OCULIST, AURIST AND RHINOLOGIST.

This practice is located in one of the metropolitan cities of the Pacific Coast; population 100,000. Practice has existed seventeen years, and is worth \$5,000 per annum *as shown by actual receipts on books*. Is the best known and most paying practice of the kind in the State. Central location; elegant offices. Purchaser succeeds to railway and sanitarium positions, and if right man, to hospital and college positions. Name and address of physicians and patients for twelve years to whom notices will be sent. Will thoroughly introduce purchaser. Family reasons, unconnected with practice, for leaving. Will be sold for \$5,000 *cash*. Seller well known to profession. Address: "Pacific Coast," care Dr. Jas. P. Parker, Union Trust Building, St. Louis, Mo.

MISCELLANY.

SOME OF THE DIFFICULTIES OF AN OCULIST IN
A SMALL CITY.

To one practicing a specialty of the eye in a small city, more or less removed from the great medical centers, the opportunities of adding to his knowledge, in the special branch to which he confines his practice, are his patients, his medical literature, and an occasional visit to a large city. One of the greatest opportunities for the examining and treating a large number and variety of cases is the free clinic, which in a small city does not always exist. It is of these difficulties and some method of overcoming them that it is my intention to write in this paper.

A special practice in a small city, very hard to get at best, can only be obtained in sufficient quantity to give one a living by drawing from the outlying community. The coming from time to time, of traveling quacks and opticians, the latter of whom obtain fabulous prices for glasses, and the former of whom advertise to such an extent that everybody who reads must know of their existence, tends to make practice all the more difficult, for with the generality of the people, there is still a prevailing idea that he who advertises most does the best work and has the best goods.

Therefore, it will be readily seen that even if a man practices in a small town he must be equally as well posted as his brother in the larger cities, for he is brought into competition not only with the honorable men of his own town and the general practitioner

who dabbles in eye work, but with an unscrupulous lot of wandering mechanics and quacks who, when they are gone, are found to have taken a large amount of money with them and left no means of redress.

In the first place, the visits to large cities. Should he perchance have a friend there who is practicing the same specialty, he goes at once to him for advice. If this friend has a large free clinic, it makes the way comparatively easy, provided his friend has the time and inclination to devote to him; otherwise he may sit for hours, and as far as treatment goes, hear nothing but collyria No. 1, 2 and 3, etc.; ointments i, ii or iii and mixtures a, b or c. Diagnosis he finds has not changed materially since he was a student, but treatment of which he is most in need, is as much a sealed book to him at the end of the clinic as it was at the beginning.

Undaunted by his first experience he turns to other channels for information. The regular medical schools are out of the question for their courses go through a whole year and when he has finished, the chances are he could, by buying the book of the man who has been lecturing or some standard work and carefully reading it, get the same information.

By carefully perusing the catalogues of the different colleges before leaving home, he has learned of such things as post-graduate schools, and to these he turns his steps. The first obstacle he meets with here are the fees. They are numerous and large and the courses extend over a space of several weeks, and if he is in luck he happens along just as one is commencing he may gain valuable information by closely following the different clinics and asking innumerable questions, but his opinion, when he has finished is, that these courses are money-making affairs, benefitting most those who give them, and his feelings will have received many a shock from contact with men who, by their manner and language, oftentimes endeavor to show him their superiority and his inferiority.

He, therefore, returns to his country home rather disgusted with his attempt. His next endeavor may be his attendance at a meeting of some large medical society. Here he finds assembled all the great lights of the country. If he is lucky enough to be a member of the Ophthalmological Society, he will have a very nice time, hear some splendid papers and many original opinions, but only a chosen few can join such a society, and as the membership is in the hands generally of one man, if he is rejected he has no

redress. A general medical society meeting with an ophthalmological section is now his best hope, but here he is again disappointed for the papers read are extremely scientific, and on very rare cases as a rule, while the simple matters and every day occurrences on which he most needs help and information are but lightly touched upon. The discussions are apt to become personal, are usurped by a few and amount to very little, but bringing a man before the public who is present at all such gatherings as a means, not of aiding his less brethren, but of ethical advertising.

The cases brought before the meeting are those of which a man has perhaps met one or two during his career, and although very interesting and instructive, are hardly what he wants.

Other papers are statistical, telling of one man's results in so many thousand cataract operations, or cases of refraction. This latter is of much benefit as I think all ophthalmologists will agree with me, that about 60 per cent of their practice is refraction.

He has a splendid time, meets many pleasant gentlemen and goes home refreshed and invigorated, fully determined to go again the next year to meet and renew the pleasant acquaintances and experiences of the previous one.

And now for his medical literature as a source of information and improvement. The great majority of writers in preparing an article for a journal, strive for one on some obscure subject or extremely rare case, thinking in all probability that from its rareness it will be read by more people and the reputation of the writer thereby increased. While it may be looked at and glanced through by a great many, it cannot possibly have the practical value to the practitioner in a small town, that a simple article on a less complex, less rarely seen, or less obtruse subject would have.

My opinion is that the number of scientific articles should not be diminished, but that the simpler diseases and remedies have more space devoted to them. The cases one sees every day are the ones in which we most desire information, while those that are seen but seldom are by their rarity almost sure of recognition.

Dubuque, Iowa.

J. W. HEUSTIS, M. D.

RECURRENT ULCERS OF THE CORNEA OF NASAL ORIGIN; EPISCLERITIS; CURE.

W R., male, 27 years of age, telegraph operator, came to me on November 28, 1893, with a small central ulcer on cornea of left eye. He stated that he had had measles about four years before and had been troubled with ulcers on the cornea of one or both eyes most of the time since. For five months of the

past year he had been under the care of an oculist. Examination of naso-pharynx revealed white atrophic growths on posterior ends of the septum and extending back into the naso-pharyngeal space nearly, if not quite a half an inch. This latter swelling in its location, unlike anything I have ever seen, was almost completely obliterated by the contraction produced by an application of a solution of cocain. The ulcer of the cornea was lightly touched with liquid carbolic acid. A solution of sulphate of atropin was instilled into the eye and the patient instructed to bathe the eye freely with hot water. In one week the corneal ulcer healed.

On December 1, the galvano-cautery was applied to the growth on the lower right posterior turbinated body.

On December 5, the eyes showed no symptoms of irritation. On the following day I cauterized the growth on the posterior part of the lower turbinated body.

December 10, patient came to my office with a severe episcleritis of the right eye which had developed after the last application of the galvano-cautery. I instilled a solution of cocain into the eye and applied levigated calomel and ordered applications of hot water to the eye. The next day I applied the galvano-cautery to the growth on the posterior part of the septum.

December 18, the episcleritis was much worse. I cauterized the remaining thickening of the septum. I instilled solution of atropin into the right eye, applied calomel massage and instructed the patient to apply hot fomentations.

On January 1, the episcleritis had disappeared and the eyes were feeling well enough for him to go to the country where he remained a week, after which he returned to his work and has had no trouble with his eyes since. EDWARD J. BROWN, M. D.

Minneapolis, Minn.

SPONGE IN ORBIT AFTER ENUCLEATION OF EYE,

On March 1, 1895, Mr. J. W. A., a stonemason, of Kansas City, applied for an operation to render a socket capable of accommodating an artificial eye, and gave the following history:

About the last of September, 1876, was doing stone work on a building at Mountainhome, Arkansas, a chip of stone struck and destroyed his left eye. He applied to a physician who enucleated the injured eye and placed a sponge in the orbit which "became so tight that the doctor could not get it out the next day," and the patient went to Springfield, Mo. and applied to a physician who attempted to make an examination but the eyelids and side of face

were so swollen that the sponge was completely concealed and the patient experienced much pain when an effort was made to open the palpebral fissure, and the physician told him that it would be necessary to give chloroform in order to remove the sponge, but the ignorant sufferer refused to take chloroform and "went to a doctor who prescribed some medicine to pour on," and "in about two weeks the eye was well." Suppuration must have been very slight as the patient asserts that "no matter (pus) ever came from the eye." He returned to work at his trade three weeks after the injury, and has experienced no inconvenience or pain from it since. While operating for the relief of the symblepharon I made an incision with a Graefe knife into the stump and introduced a lachrymal probe and observed that the patient experienced no pain, though the point of the probe was one inch beyond the cocaineized area. I was preparing to remove a portion of the stump for microscopic examination, when a young physician who was present observed my intentions and allowed his enthusiasm to get control of his talking organs, and the suspicious patient forbade "anything being taken away," and as he remarked he "was paying a good fee for the operation and had but little confidence in surgeons," and showed a disposition to be very unaccommodating, I did not insist upon securing the desired section. The sponge evidently prevented contraction of the orbital cavity and shrinking of the surrounding tissues. He is now wearing an artificial eye, the excursions of which are equal to those of the good eye, with which it moves conjointly, and it requires an expert to observe that the man has an artificial eye.

J. P. P.

BOOK NOTICES.

THE TOXIC AMBLYOPIAS; THEIR SYMPTOMS, VARIETIES, PATHOLOGY AND TREATMENT. By Casey A. Wood, C. M., M. D., Professor of Ophthalmology in the Chicago Post-Graduate Medical School; Ophthalmic Surgeon to Cook County Hospital, and to the Emergency Hospital of Chicago; Associate Editor of the ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY, ETC.

This handsome book of about one hundred pages, substantially bound in cloth, is divided into seven chapters or parts, as follows:

1. Definitions and classifications.
- 2, 3. The etiology of toxic amblyopias.
4. The predisposing causes, symptoms, diagnosis and treatment.
5. A continuation of symptoms, diagnosis and treatment.

6. Agents of minor importance.

7. Pathology and treatment of the more important toxic amblyopias; prophylaxis and hygiene.

Many of our readers are already familiar with a large share of the contents of Dr. Wood's book on the "Toxic Amblyopias" as it appeared "piece meal" in the *ANNALS* during the years 1892, 1893 and 1894, and it was to satisfy the demand made by the readers of the *ANNALS* that Dr. Wood was induced to continue the laborious task of completing the work and having it bound in substantial book form. It is the most exhaustive work on the subject with which the editor of the *ANNALS* is familiar.

The labor and money expended in compiling the contents was greater than most of us could be induced to expend. The book will be a valuable addition to the physicians working library.

J. P. P.

AN OLD FRENCH OPHTHALMIC JOURNAL IN AMERICAN DRESS.

The *Annales d'Oculistique*, so familiar to many of our readers, is to hereafter appear in America. The January, 1895, number has already been translated and printed in the English language. The English edition is edited by Dr. George T. Stevens, 33 West Thirty-third street, New York, and published by the Transatlantic Publishing Company, 63 Fifth avenue, New York. It will appear in monthly numbers of 80 pages each. The annual subscription price of the English edition is \$5. It is certainly a welcome addition to the list of ophthalmic journals published in the United States, and with so accomplished an editor as Dr. Stevens we predict for it a prosperous and useful career.

J. P. P.

TRANSACTIONS OF THE SIXTEENTH ANNUAL MEETING OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION, held in the City of Washington, D. C., May 30, 31 and June 1, 1894. D. Appleton & Co., New York.

This volume of the transactions of the American Laryngological Association contains an unusually large number of valuable papers. In the annual address of the president, Dr. D. Bryson Delavan, attention is called to the history and early work of the association, and the struggles of the pioneer specialists in diseases of the throat from the time they groped blindly after truth up to the brilliant era when the laryngoscope was introduced (1860) by Manuel Garcia, and since the electric light and modern scientific methods. The history of the association is remarkable on account of the energy and talent of its founders and unceasing work of its present members. The association now has sixty "Active Fellows" and nineteen "Honorary" and "Corresponding Fellows."

J. P. P.

CHEMICALLY PURE HYPOPHOSPHITES. SYRUP OF HYDRIODIC ACID. THERAPEUTICAL INDICATIONS FOR USE, WITH CLINICAL DATA. Twelfth edition. Edited by R. W. Gardner, Pharmaceutical Chemist, 158 William street, New York.

Mr. Gardner has expended much time and study on the chemistry and therapeutics of the Iodides and Hypophosphites, which renders his book of real value to the medical profession. The entire book contains one hundred and ninety-four pages, seventy-six pages being devoted to the "Administration of Iodine," in the form of Syrup of Hydriodic Acid ("Iodide of Hydrogen"), and one hundred and eighteen pages to Chemically Pure Hypophosphites.

The Therapeutical Data has been compiled from the writings of some of the best known therapeutists of England, France, Germany, America, and other countries. As the author states in the Preface: "Text-books contain very little on the therapeutics of Hydriodic Acid," and his efforts have been appreciated, as evidenced by the writings of a long list of contributors to medical literature.

The limited space at our disposal prevents us from mentioning the names of the distinguished contributors or commenting upon the results of their clinical experiences with Syrups of Hydriodic Acid, and Chemically Pure Hypophosphites, but a perusal of the book will well repay the physician, in these days while "brilliant surgery" is allowed to so attract the medical mind from therapeutics.

J. P. P.

PEROXID OF HYDROGEN.

I have used Peroxid of Hydrogen quite extensively for cleansing discharging ears, the nasal and accessory cavities, and have tried all the brands of the preparation in the market, and once thought one manufacturer's make as good as that of another and bought the cheapest as a matter of economy, but recent experience has taught me that the difference in quality is greater than the difference in price. After an unpleasant experience with a solution of Peroxid of Hydrogen which severely injured the mucous membrane, I bought and examined, chemically, a bottle of each preparation of H_2O_2 in the market, and was surprised to find so much difference. Some are useless, and others worse than useless, because they contain too little available oxygen and too much free acids (phosphoric, sulphuric, hydrochloric). I now order Marchand's (medicinal) exclusively because I find it contains the desired quantity of available oxygen and not enough free acid to be objectionable, and its keeping properties are all that could be desired.

By inquiry I learn that Marchand's is the preparation that is used by almost all surgeons, and is considered, by them, the standard.

J. P. PARKER, Ph. G., M. D.

ANNALS
—OF—
OPHTHALMOLOGY
—AND—
OTOLOGY.

VOL. IV.

JULY, 1895.

No. 3.

REMARKS ON THE FIELD OF VISION IN CERTAIN
CASES OF "NEGLECTED EYES."

By G. E. DE SCHWEINITZ, M. D.,
OF PHILADELPHIA.¹

THE following cases illustrate some of the visual-field phenomena in that type of monocular amblyopia which is common with convergent and divergent strabismus. Although we may be familiar with the changes here depicted, the field of vision of "neglected eyes" is not always carefully investigated, and I believe that greater attention to this method of examination would add to our knowledge of these amblyopias.

¹ Read before the Ophthalmic Section of the College of Physicians of Philadelphia, March, 1895.

To introduce the subject I quote a paragraph written by Dr. Henry D. Noyes:

“Monocular amblyopia is very common in strabismus convergens and not infrequent in strabismus divergens. This may or may not be associated with high degrees of hyperopia or with astigmatism, possibly irregular. We meet with it where the degree of ametropia differs little from that of the eye with good vision, and in a very large proportion, perhaps in the majority of cases, no lesion can be found with the ophthalmoscope. On this point it is important to bestow careful attention. No small number of cases exhibit what are evidently congenital abnormalities in the papilla. In my records are such conditions as follows: An extraordinary amount of pigment deposit along the border; the presence of connective tissue on edge of nerve and running along the vessels (not to be confounded with opaque nerve fibers); a dull or slaty-colored and opaque disc with hazy edges; extreme hyperemia, both of capillaries and veins; the nerve swollen as in papillitis, a dark gray or slaty spot upon the disc and the rest of the surface an opaque white; coloboma of the sheath of the nerve or a very deep and irregular excavation which was so interpreted. Besides, one must carefully scrutinize the macula and it must be done with dilated pupil. Not rarely will one find minute specks—white, yellow or glistening—clustered here, which indicate lesion either of the choroid or retina. There may be one or more marked pigment specks which will denote a previous inflammatory lesion. A notable number of cases, and the majority, will not reveal any visible lesion. In the examination of the visual field we are often prevented from attaining exact knowledge by the extreme youth of the subjects. When, however, they are sufficiently intelligent, we frequently find that the amblyopia is central, and a defined scotoma for red may be sometimes mapped out provided a small card 5 mm. square and dim light can be employed. The scotoma may be very small and will be better discovered on a dark plane surface than by the perimeter. Sometimes a patient will say that over a small space, not the blind spot of Mariotte, a small candle flame is not perceived. This means a small absolute scotoma. In one case I found nasal (medial) amblyopia with the line of demarcation vertical. It was not difficult to show the decided difference in perceptive power of the respective halves of the retina—this might be called hemiamblyopia.”

For the purpose of study I have gathered the cases into three groups, as follows:

GROUP I. CASES IN WHICH THE VISUAL FIELD FOR FORM AND
COLORS IS NORMAL, OR PRACTICALLY NORMAL, AND
IN WHICH THE ACCURACY OF COLOR PERCEP-
TION AT THE MACULA, OR BETWEEN
IT AND THE FIXING POINT,
IS UNAFFECTED.

Two examples will suffice:

Case I. Mrs. P., 39 years of age; denies strabismus, but has never seen well with the left eye. As ordinarily observed, there is no abnormal convergence, but the eyes wander in under cover and there is slight convergence of the left one on fixation at 30 cm., or if tested by means of the corneal reflex of the ophthalmoscope.

The right eye is hypermetropic and slightly astigmatic and

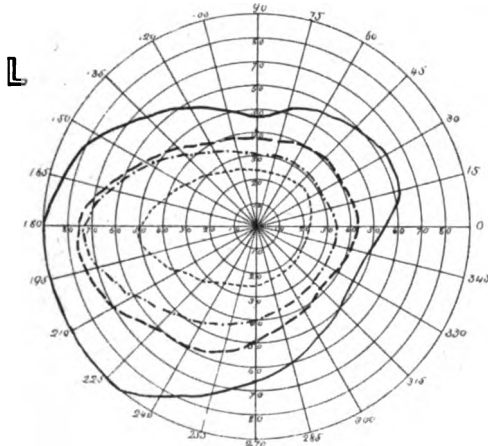


FIG. 1.

Diagram of the field of vision of Case 1, Group 1. Normal in all respects.

possesses full acuity of vision. The vision of the left eye equals counting fingers at 1 foot, the refraction is $+3.50$ S. $\odot +.75$ C., axis V., the corneal astigmatism with the Javal ophthalmometer being 1.50 diopters according to the rule, axis 90° .

There is no ophthalmoscopic abnormality in the right eye; in the left the disc is a vertical oval, of good color, contains a small physiological cup, and is bounded by a pigment crescent on the temporal side; the vessels are of normal size.

After wearing the correction for nearly a year, the patient returned with the vision of the right eye $\frac{8}{30}$, of the left eye $\frac{8}{30}$. She had "amused herself by practising," as she expressed it, with her left eye.

The field of vision² (Fig. 1) is practically normal in all respects, and there is nowhere an area of diminished color perception nor a scotoma, save the natural blind spot, which is promptly acknowledged.

Case II. Mrs. J., 26 years of age, had convergent strabismus of the left eye in childhood, but "outgrew it." There is now a slight convergence, about 1 mm. Vision equals $\frac{6}{40}$. The right eye, save for a slight hypermetropic astigmatism, is entirely normal, and possesses full visual acuity.

In the left eye the optic disc is a vertical oval, rather hyperemic, a slight crescent bounding its temporal border. The ophthalmometer reveals a corneal astigmatism of 1 diopter according to the rule, with its axis vertical, and the refraction of the eye is

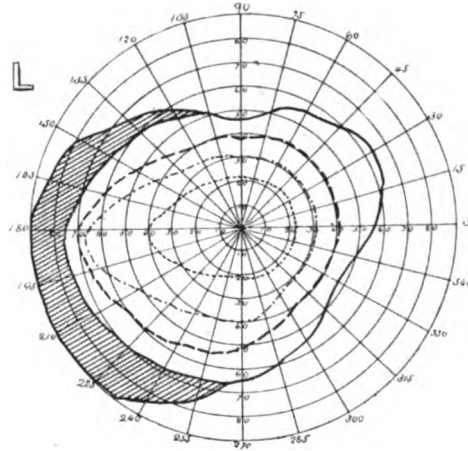


FIG. 2.

Diagram of the field of vision of Case 2, Group 1. Color field practically normal; slight contraction on the temporal side of the form field.

+ 1 S. \bigcirc + 0.50 C., axis V. With this glass vision equals $\frac{6}{30}$. Eighteen months later the vision of this eye was about the same, perhaps somewhat better, $\frac{6}{22}$ being recorded.

The field of vision (Fig. 2), save for slight contraction on the temporal side, is practically normal and the color sense of normal standard.

² All the diagrams of the visual fields are constructed as follows: White, ———; blue, — — —; red, — . . . — . . .; green, Scotomas are represented by dotted areas; peripheral contractions by shading with parallel lines.

GROUP II. CASES CHARACTERIZED (a) BY CONTRACTION OF ONE OR MORE OF THE COLOR FIELDS, THE FORM FIELD REMAINING NORMAL, AND (b) BY IRREGULAR CONTRACTION OF BOTH FORM AND COLOR FIELDS, SOMETIMES ASSOCIATED WITH REVERSAL OF THE RED AND BLUE LINES.

Case I. S. Y., a man 22 years of age, with a vague history of inflammation of his eyes in childhood, of which there are no traces, presented a monocular strabismus of the left eye, the angle of squint being 28° . Vision in this eye equaled counting fingers at 1 m. There is no corneal astigmatism, but a hypermetropia of 4 D. at the macula. The disc is a vertical oval, of good color; the

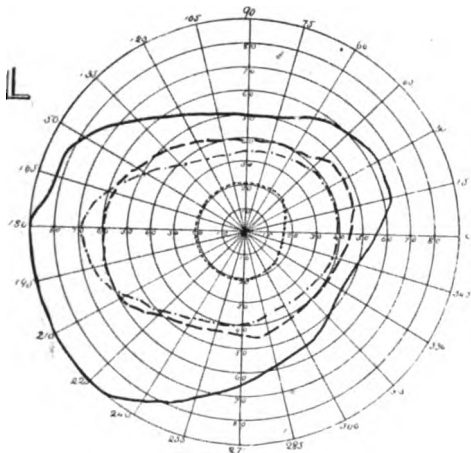


FIG. 3.

Diagram of the field of vision of Case 1, Group 2, exhibiting partial reversal of the red and blue lines, with marked restriction of the green field.

vessels are distorted and pass to the nasal side. After glasses were ordered, and tenotomy of the internus and advancement of the externus had been performed, there was restoration of parallelism of the visual axes, but no improvement in vision. The right eye is slightly hypermetropic, but normal in all other respects.

The dimensions of the form field are normal. There is slight contraction of the blue field and partial reversal of the red and blue lines, with marked restriction of the green field, but no scotoma and no diminution of central color perception. (Fig. 3.)

Case II. Annie J., 25 years of age, has marked divergent strabismus of the left eye, the angle of squint being 34° and the

myopia 16 diopters. The optic disc, surrounded by a posterior staphyloma, is distinctly gray in its deeper layers. The vessels are normal in size and distribution; V. equals counting fingers at 1 foot. The right eye, save for slight myopia, is normal.

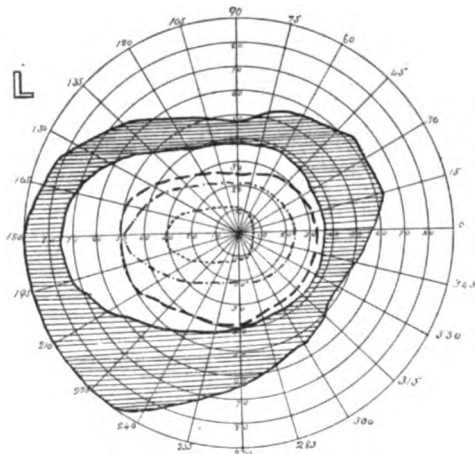


FIG. 4.

Diagram of the field of vision of Case 2, Group 2, showing marked contraction of form and color fields, with practically a half defect in the contracted green field.

The visual field (Fig. 4) shows marked contraction of form and color fields, the restriction being relatively greater for green, which is particularly defective upon the nasal side, practically a half defect, or hemiachromatopsia for this color.

Case III. C. E., a boy 16 years of age, had whooping-cough in childhood, and since then divergent strabismus of the right eye in which the vision amounts to counting fingers at 2 feet. The exact refraction of the eye is $-17\text{ D. } \ominus -2\text{ C., axis } 25$, the corneal astigmatism is 2.50 D. , according to the rule, with the axis at 115° . A glass does not improve the vision. The optic disc is a narrow oval with its axis at 115° , grayish-red in color and skirted by an

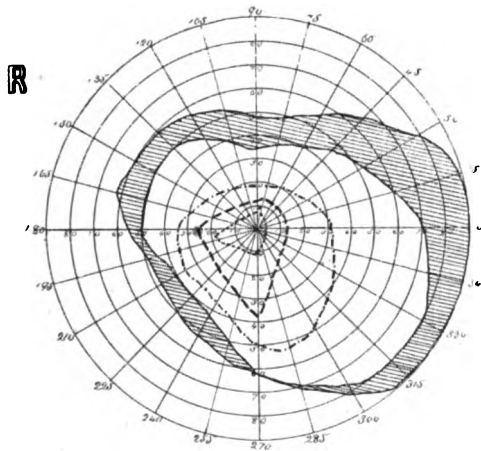


FIG. 5.

Diagram of the field of vision of Case 8, Group 2. Contraction of form and color fields; half defect in the very contracted green field; reversal of the red and blue lines.

atrophic area upon the nasal side twice as wide as the disc. In the left eye the disc is somewhat gray in its deeper layers, but after the correction of a low-grade hypermetropic astigmatism, the vision is normal.

The field of vision upon the right side (Fig. 5) shows contraction for form and colors and again a species of half defect in the very contracted green field, the larger portion of the field being in this instance upon the nasal side. The red and blue lines are reversed.

**GROUP III. CASES WITH OR WITHOUT CONCENTRIC CONTRACTION
OF THE COLOR AND FORM FIELDS, BUT ASSOCIATED
WITH (a) DIMINISHED CENTRAL COLOR PERCEPTION
EITHER AT THE POINT OF FIXATION AND SUR-
ROUNDING IT, OR BETWEEN IT AND THE
BLIND SPOT, OR (b) WITH SCOTOMA,
CHIEFLY FOR COLORS.**

Case I. M. G., a lad 18 years of age, has no history of squint and no strabismus is now demonstrable. Since childhood he has been amblyopic in the right eye. Vision equals quantitative light perception. The optic disc is a vertical oval with slightly edematous surface. The veins are full and tortuous; macula + 4 D., vertical vessels 7 D. With the ophthalmometer the corneal astig-

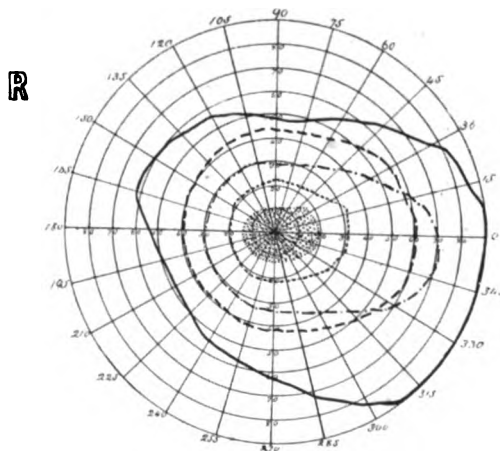


FIG. 6.

Diagram of the field of vision of Case 1, Group 3. Practically no contraction, except in the green field, but a central area of loss of perception of colors with small test objects and weak illumination, indicated by the dotted portion.

matism is 3 diopters according to the rule, with the axis vertical. Correction does not improve the vision. The left eye is normal; refraction low H.

The form field is normal, the red field practically normal; there is slight contraction of the blue field, decided restriction of the green field, and an oval area 35° in its long and 20° in its short diameter, within which there is distinct loss of the perception of form and colors with small test objects and weak illumination, although with large tests object colors are still imperfectly recognized. (Fig 6)

Case II. W. S., a man 27 years of age, has had convergent strabismus of the right eye, with amblyopia, since childhood. The refraction of the right eye is $+2$ D. $\ominus +.50$ D. C., axis 105, corneal astigmatism being 1 diopter, according to the rule with its axis at 105. The macula is slightly granular, the disc of fairly good color, but there is marked broadening of the scleral ring. All vessels, but especially the veins, are tortuous. The left eye, slightly hypermetropic, is normal.

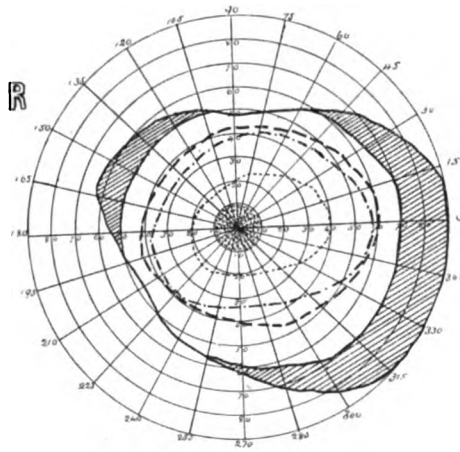


FIG. 7.

Diagram of the field of vision of Case 2, Group 3. Area of diminished color perception similar to that seen in Fig. 6; slight contraction of the form field.

There is slight contraction of the form field; the red field is not far from normal; the blue and green fields are slightly contracted, and there is a circular area surrounding the fixing point for about 10° in which there is marked diminution in the color sense, all colors appearing pale or paler than normal, although with large objects they are still recognized in their true characters. The point at which the color pales is sharply marked from that at which it is perceived in its natural intensity. (Fig. 7.)

Case III. John L., 49 years of age, gives a history of strabismus in childhood, but there is none now demonstrable, nor is there any deviation of the left eye, which has always been amblyopic.

The disc is a vertical oval, the nasal margins are blurred, there is grayness in the deeper layers and marked tortuosity of the veins. The actual refraction is $+5$ D. $\ominus +2$ D. C., axis 120, the corneal

astigmatism being 2.50 diopters, according to the rule, with the axis at 120; $V. = \frac{0}{45}$. The refraction of the right eye is H., $V. =$ normal.

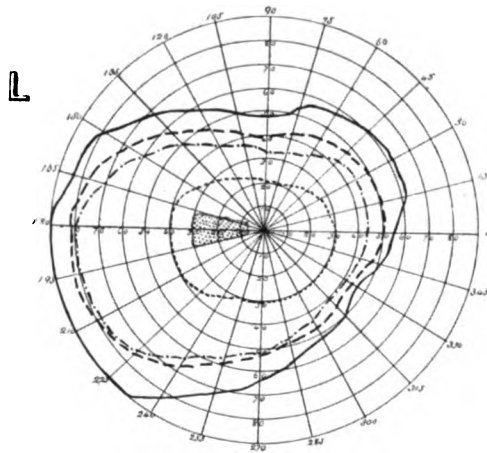


FIG. 8.

Diagram of the field of vision of Case 3, Group 3. Slight contraction of the green field and wedge-shaped scotoma for small colored objects observed under weak illumination, indicated by the dotted portion of the diagram.

The field of vision of the defective eye (Fig. 8) is normal for form and for red and blue. There is slight contraction of the green field, and between 5° and 30° to the temporal side there is a wedge-shaped scotoma for small colored objects observed under weak illumination, although the colors are still recognized as such when the test object is large and the illumination bright.

Case IV. Margaret S., 50 years of age, has had from childhood a "slight cast in the right eye," which was attributed to fright. There is moderate convergence of O. D., vision equals counting fingers at 2 feet; the disc is a vertical oval, gray, the scleral ring broadened all around and the veins full. The refraction is + 3 D. \odot + 3 D. C., axis 100. This glass does not improve vision. The left eye presents no important abnormality; refraction a slight myopic astigmatism.

There is marked irregular contraction of the form field of the right eye and a large scotoma for colors passing 20° to the nasal

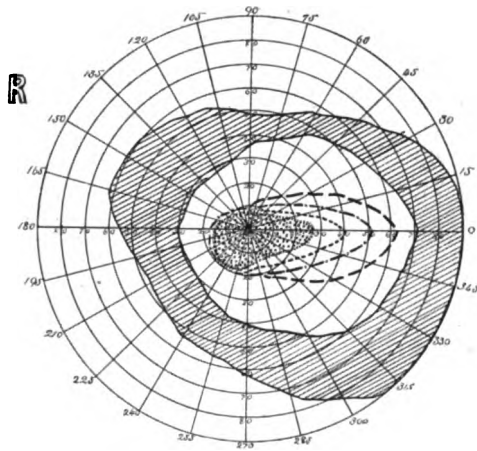


FIG. 9.

Diagram of the field of vision of Case 4, Group 3. Marked contraction of form and color fields and large scotoma for colors indicated by the dotted area in the center of the diagram. There is a species of hemiachromatopsia, colors being chiefly perceived upon the temporal side.

side and nearly 30° to the temporal, 20° below and 10° above. The contraction of the color field is peculiar, blue and green being seen only on the temporal side—again a species of hemiachromatopsia—while red is likewise seen on the temporal side, lost, as are all colors in the scotomatous area, and faintly reappears on the nasal margin of the acquired blind spot. When the patient was last seen there was no change in the vision. (Fig. 9.)

It will be noted:

1. That the cases with normal visual fields and good color perception seem capable of acquiring increased visual acuity, as, for example, Case 1 of the first group.

2. That in the cases with marked abnormalities in the visual fields, particularly in the form of areas of diminished color perception, or color scotomas, there are visible changes in the discs, although in no instance was such an appearance evident as may be seen in the nerve head in toxic amblyopia. Visual acuity in these cases did not improve.

3. That in some cases, for example, Case 1 of Group 3, the abnormality of the visual field is analogous to that seen in hysteria, neurasthenia and allied conditions usually associated with retinal tire.

With regard to the vision of these amblyopic eyes we know:

(a.) The vision of a squinting eye may greatly improve, or the amblyopia entirely disappear, as, for example, in W. B. Johnson's³ capital case, when for any reason the non-squinting eye becomes suddenly blind, or is removed. The following case bearing upon this point is interesting:

C. S., a man 30 years of age, has had moderate convergent strabismus of O. S. since early childhood, and has never seen well with this eye. About the 1st of November, 1894, the retina of the right, or seeing eye, became detached, and when he presented himself for treatment, December 12, 1894, V. of O. D. equaled counting fingers in the lower field; V. of O. S. = $\frac{6}{18}$, barely, and spells No. 4 at 18 cm. with difficulty.

The usual medicinal treatment of retinal detachment—rest in the recumbent posture, pressure bandage and pilocarpin diaphoresis—was pursued, with the result of obtaining in three weeks partial reattachment of the displaced retina, and V. = $\frac{6}{12}$. Vision of the left eye remained, as before, $\frac{6}{18}$. A relapse then occurred, vision of O. D. sinking to about one-third of normal, uncertainly appreciated. The patient declining operative interference, the refractive error of the left eye (+ 0.75 S. \ominus + 0.75 C., axis 30°) was carefully neutralized, and the patient urged to use this eye to the exclusion of the other. In two weeks the vision rose from $\frac{6}{18}$ to $\frac{6}{9}$, and several letters on the $\frac{6}{7.5}$ line. The color field in this eye was normal in all respects.

(b.) The vision of the squinting eye may be improved by exercise,⁴ although this is an uncommon record, perhaps, as Randall suggests, "because of the youth of many of the

³ *Trans. Amer. Ophth. Soc.*, Vol. VI., Part 3, p. 551.

⁴ Consult discussion on W. B. Johnson's paper, *loc. cit.*; cases by Risley and Holt, with reference to Javal's case.

patients and the difficulty of applying the tests of vision in such cases," but often, no doubt, because the process is tedious and the results uncertain and discouraging. As every practical ophthalmologist knows, in many cases of anisometropia the visual acuity of the eye with the greater refractive error may be markedly sharpened by exercising its neglected functions, although it is doubtful, as Gould⁵ points out, whether this line of practice has received the attention it deserves. While the amblyopia of anisometropia, unassociated with squint, is not strictly germane to the present topic, it at least has some bearing upon the value of exercise and practice with the deficient organ.

If it is true, and it appears to be from such a case as Johnson's, that amblyopia may be due to suppression of the visual image, and furthermore true that such cases rapidly regain vision if required, by reason of the removal or blindness of the fellow eye, to assume the responsibilities of the visual act, is it not worth while to carefully investigate, as Dr. Noyes urges, the field, color field and color sense of these "neglected eyes" and to endeavor to obtain data which might lead to more certain prognostications as to the result of exercising the visual functions than we now possess, at least than the records seem to show that we possess?⁶

⁵ *The Medical News*, December 31, 1892.

⁶ I am indebted to my former assistant, Dr. William Bruner, for aid in preparing the diagrams of the visual fields of the cases described in this paper.

SOME FINDINGS CONCERNING SO-CALLED MUSCLE- IMBALANCE AND ITS TREATMENT.

BY GEORGE M. GOULD, A. M., M. D.,
OF PHILADELPHIA.

SINCE my suggestion of a method of treating exophoria by prism-gymnastics I have received so many letters concerning some detail or other that I have concluded that a few thoughts derived from added experience in the study of innervational incoordination would perhaps be welcomed by many.

As to the methods of estimating these innervational abnormalities unless a definite plan of proceeding be adopted confusion inevitably arises. I first of all estimate the static position of rest of the visual axes at 20 feet, and with the Maddox colored rod. This gives the exophoria, esophoria, hyperphoria, or orthophoria, accurately enough for all practical purposes. I do not test the conditions at near range, as I believe all such tests are both comparatively unnecessary and comparatively fallacious.

Next in order is the estimation of the dynamic functions, and the first is the power of abduction, which must be made before that of adduction. For this the improved "double battery of prisms," is a serviceable and sufficient instrument. There is no difficulty about diagnosing the power of abduction, as it is always definite, sharply limited, and quite uniformly constant. With an abduction of over 8° or 9° one may look for trouble; and the higher it runs the more will be the trouble.

But in the diagnosis of primary adduction many difficulties arise, and different physicians will vary widely in their estimate at the same time and upon the same patient, dependent upon their method of making the test, or upon what is called adduction. Using the "double battery of prisms" I pass slowly from lower to higher prisms, step by step, until one eye slips outward or until diplopia is noted. I find it is best to check the patient's answers by observation of his eyes, as sometimes he will not notice what should be diplopia, but the slipping aside of one eye, or the vibration of the corneas from side to side, tells the observer at once when adduction has been renounced. I then slowly return from the higher powers to the lower until binocular singleness of vision is again reached. One or two sweeps up and down are usually necessary to determine this initial or primary adduction power. It seems to me that it is not properly the highest point to which adduction may be slowly carried from zero upward, nor is it the lowest point at which the eyes slip back into the habitual groove of binocular unity in passing from diplopia toward zero. There is an unnamed neutral zone or boundary line of indefinite and fluctuating limits between the two points. The two points have also not obtained a naming. It is with some trembling that I venture to suggest three coinages. It is premised that the tests are made with prisms, bases out, of equal strengths before each eye, and that the passage from zero to high degrees, or *vice versa*, is by slowly-proceeding, and successive gradations. Proceeding thus from zero upwards:

1. THE UPPER DIPLOPSIC POINT corresponds to that degree of combined prism strengths at which definite diplopia appears.

Proceeding downward from this point again towards zero:

2. THE LOWER DIPLOPSIC POINT corresponds to that degree of combined prism strengths at which binocular singleness of vision (which might be called *binocular monopsia*) is again resumed.

3. THE DIPLOPSIC ZONE is the space between the upper diploptic point and the lower diploptic point.

This nomenclature, you will notice, does not accept the custom-sanctioned method of naming many of our visual

abnormalities 'opias instead of 'opsias, derived as the words are from the Greek *ὀψις*, or *ωψ*. It seems outlandish to construct our words, *amblyopia*, *diplopia*, *cyclopia*, *myopia*, etc., as they are written. *Hemianopsia*, *megalopsia*, *micropsia*, etc., are words correctly formed, and it seems to me that we should write *amblyopsia*, *diplopsia*, *cyclopsia*, *monopsia*, because we take an unwarrantable liberty when we "traduce" the Greek letter *ψ* into our single letter *p*. Our medical myopsic minters should logically have made us say, *eclampia*, *polydipia*, *dropical*, and *droppy*, instead of *eclampsia*, *polydipsia*, *drop-sical* and *dropsy*. Perhaps the authors of our 'opia barbarisms thought, if they thought at all, that medical English could hardly be made more contemptible, and if we agree with them we may go on in the old ruts with our 'opeless, myopic, amblyopic 'opias.

I have been in the habit of estimating primary adduction as the middle point of the diploptic zone, but as this or any estimate of adduction is indefinite and is always varying, it would be more accurate to establish and record the three facts, the upper diploptic point, and the lower diploptic point, which constitute the limits of the diploptic zone. I believe that the establishment of these factors of ocular motility have not only the interest of theoretic accuracy, but that they have clinical bearings and therapeutic significance.

There yet remains one element of importance in the diagnosis of the dynamic conditions of the eye. This is what I have named convergence-stimulus adduction, a factor the knowledge of which I have found of great practical utility, especially in prognosis. By convergence-stimulus adduction, I mean the limit of 20-foot adductive power gained within a few minutes by successively and rapidly-increased handicapping of the adduction power by prisms, bases out, and in conjunction with intense fixation of the patient's gaze upon an object repeatedly carried from the near point to the distant point.

In young persons with subnormal adduction but with good nervous or mental power, and even in older people under the same conditions, the convergence-stimulus adduction is usually from twice to three times that of simple or primary adduc-

tion. In the neurasthenic and in the aged, convergence-stimulus adduction is much less. The point of practical utility consists in the fact that the extent of the diplopic zone, or the difference between primary adduction and convergence-stimulus adduction quite accurately forecasts the reaction power of the patient, and thus establishes the probable length of treatment and the general prognosis. The greater the difference the better the prognosis.

The diagnosis of hyperphoria is simple and subject to few doubts. I would only suggest one important addition: The Maddox rod for this purpose should be long and set as closely to the cornea as possible, and then it should be made out clearly whether or not there is any variation in the amount of hyperphoria when the patient's head is raised and lowered as far as possible, while the gaze, of course, is fixed upon the light 20 feet away on a level with the eyes. If there is a variation its amount should be noted. It has significance.

I have found that a small jet of gas-light coming horizontally toward the patient, with a large background of black velvet, makes a brilliant and helpful object-light for all dynamic tests.

Permit me here to interject a word as to a peculiar finding I have stumbled upon in the practical carrying out of prism-gymnastics after the manner I have indicated. It has considerable suggestiveness for the oculist, but it may also be of more or less interest to the general neurologist. It is this: In gazing at the object moved from the near point to the distant point, the patient is able to preserve monopsia and sustain a prism-handicap of a considerably higher degree, if, while sitting still, the object is carried away by another. Diplopia will supervene more quickly during the recession by the mere fact of the patient assuming the standing position, and if the patient attempt walking backward from the unmoved object the innervation previously capable is then no longer obtainable. Sometimes, even, the patient cannot bring about monopsia with a handicap previously borne at 20 feet while sitting, but in standing and walking toward the object it is impossible, although at the closest range and with the most powerful effort. This fact, therefore, is

the exact reverse of that known as the Reinforcement of Reflexes. In extreme ocular convergence-stimulus adduction synchronous innervation of the muscles of the body lessens and destroys the highest ocular adduction power instead of increasing it. I have even noticed that the jar of a definite step will destroy the delicate equilibrium, when it was held by a soft and sliding step backward.

In order, therefore, to gain a complete expression of the dynamic functions of the eyes we must obtain knowledge of seven factors:

1. The lateral "Phoria,"—i. e., the lateral orthophoria, the esophoria, or the exophoria.
2. The vertical "Phoria,"—i. e., the vertical orthophoria, the hypophoria, or the hyperphoria.
3. Abduction.
4. The Upper Diplopic Point. }
5. The Lower Diplopic Point. } The Diplopic Zone.
6. Primary (or simple) Adduction.
7. Secondary (or convergence-stimulus) Adduction.

With a statement of these seven elements, together, of course, with the diagnosis of the refractive error, one who has never seen the patient may gain a pretty accurate knowledge of the prognosis and therapeutics of a given case of functional ocular disease.

The question arises: What is Orthophoria? The answer of the distinguished and honored originator of the word is well known. But we must be on our guard against the unconscious admission that orthophoria is normal, healthy, or the best sort of "phoria." My experience is that a person with orthophoria, i. e., one whose visual axes in a condition of relaxation and rest meet upon an object 20 feet away is usually in an unphysiologic working condition if he has much near-range work to do. Orthophoria is generally a poor sort of 'phoria; it is functional disease; it is in a sense not orthophoria. Our urban slaves of civilization, the severe ocular laborers, need that excess of adduction power that we call esophoria, or its equivalent, to insure the best physiologic function. Esophoria of from 2° to 5° is thus, again in a sense, orthophoria.

But in the light of my experience the terms orthophoria, esophoria, and exophoria, are often inexact and misleading,

always unsatisfying, and, standing alone, they signify little or nothing. Although compelled to use them they are of no use to me except as coupled with the other six factors I have enumerated. One patient with "orthophoria" may need no treatment, whilst another with the same condition may need long treatment. It all depends upon the other factors, and especially upon the relation between abduction and the two adductions, primary and secondary.

In the first place treatment of muscular anomalies should depend upon two other things:

1. It should usually depend upon the existence of symptoms ascribable to the dynamic strain. Nature has so many subtle ways of compensation and of self-cure, that we are grossly impertinent if without symptoms we rush in with our blundering devices and our asinarian therapeutics. The antics of some drug-maniacs and operation-madmen seem to rest upon the assumption that God has but little wit, and that He needs much instruction in physiologic matters. Let us at least wait for some sign, such as pain, asthenopia, etc., that He has failed.

2. Treatment should also depend upon the thorough trial of correction of the refraction error. No living man with a vestige of native modesty is at all sure that he knows much about the precise etiologic relations between errors of refraction and errors of motor-coordination, but every observant and intelligent student is thoroughly convinced that, in a general way, refraction-errors are the vastly preponderant source of eye-strain. It, therefore, behooves us to first see if accurate correction of the ametropia will not bring relief, and perhaps superinduce comfortable muscular function. If it does neither then may we proceed with our endeavors to learn other causes of discomfort, and to institute the means of relief.

As to the treatment of esophoria, the hope has proved fallacious that I at one time entertained that a reversal of the method that had proved so successful in exophoria would be of similar service in esophoria. But in learning this lesson I have learned another, and that is that usually with proper correction of the ametropia, esophoria as a rule ceases to become trouble-

some, or is gradually cured by the correction of the refraction-error. This especial lesson, however, so far as concerns esophoria, it must be confessed, is based upon a very limited experience. While I have had in the last years perhaps several hundred cases of exophoria, I have not had, I guess, over a dozen cases of esophoria. One, though not my own, yet personally known to me, was a dismal failure. The internal recti tendons (not by myself) were both cut clean off on two separate occasions, with a prompt return in a few weeks of the total (16° to 20°) esophoric imbalance, the sleepiness and the asthenopia. Another patient, when last seen, had about 18° of esophoria without the slightest symptom of inconvenience. My other cases, as I have said, either find no inconvenience from moderate degrees of esophoria, or the normal balance of the muscles under proper glasses is being certainly and progressively established.

As to hyperphoria, a similar result of the use of correct spectacles is usually seen, and this result is hastened by prism-gymnastics, handicapping the tendency to binocular vision and arousing an increase of effort by the will, and by extreme motility of the eyes upward and downward, the head being kept rigid.

When the hyperphoria is high, I am accustomed to correct only a part of it in the spectacles by prisms, leaving an unreachd ideal for the nervous mechanism to strive toward. In one case, the highest degree of non-traumatic hyperphoria I have ever seen, there was a defect of 15° . The man had visited several oculists, and had about made up his unwilling mind to submit to tenotomization. The diplopia, headache, etc., were intolerable. I gave him a proper correction of his ametropia, which he had never had, with a correction of two-thirds of his hyperphoria, which produced "monopsia" at once, and a most exuberant satisfaction and gratitude; I also instructed him in simple methods of ocular gymnastics. In a short time the 5° of uncorrected hyperphoria had about disappeared, and I expect at his next visit to halve the hyperphoric prismatic correction.

As to the treatment of exophoria, or as I prefer to call it, of subnormal adduction, I have nothing to recant and little to modify. The plan previously suggested has proved entirely

satisfactory. And this is all the more satisfying because the vast majority of all so-called muscle-troubles are of this class. I have not had time to gather accurate statistics, but I would judge that fully 95% of all my cases of "phoria" requiring treatment have been cases of so-called exophoria. I consider the method applicable whenever—even in cases of divergent strabismus—there is any tendency, or power whatever, toward binocular fusion. Whenever there is (convergent) life there is (binocular) hope. It is wonderful what marvels of therapeutics nature will bring about if we give her only a wee bit of help here, remove a little obstacle there, and if we arouse effort and instil persistent patience everywhere.

The essence of the matter in all these cases of so-called exophoria is to increase the adduction-power. A fig for this fetich of exophoria! Bring the habitual power of adduction sufficiently high and the "exophoria" may be left to care for itself; both it and the symptoms will soon disappear. Here, in fact, lies one of the troublesome things about the method. When the symptoms disappear the patients cease coming, thinking they are "cured"—when they are only temporarily relieved. Quite a number of patients, certainly not at my suggestion, and against my protest, keep their prisms for "emergencies," and whenever, from overuse, ill-health, or from any cause whatsoever, headache or other symptoms recur they use them for awhile with speedy relief.

The proper way to do is to carry the adduction-power so high, and fix it there by continued gymnastics so permanently, that the treatment may once for all be discontinued. The adduction-power has sometimes to be carried very high indeed before this safe point is reached. I have had a number of patients in whom it was brought to 80°, in several to 90°, and in two to 100° or 110°.

In no other class of cases is it so impossible to lay down rules as in these so-called, wrongly-called, muscle-cases. Every case becomes a study in which all treatment must be guided by careful and prudent intelligence, applied to the purely individual and ever-varying condition.

The fundamental principle underlying this non-operative gymnastic therapeutics of muscular imbalances is the conception of the eye as a living, self-healing, marvelously delicate,

dynamic mechanism. Our aim should be to remove obstacles and provide helps for it in its struggle to do the awful work thrust suddenly upon it, of civilization, with an instrument not prepared, habited, or fitted for that work. Our single aim is to provide helps so that it may do its labor physiologically. We must utterly root out of our minds the odiously wooden-headed assumption that the eye is a dead, rigid, and mechanic system, and that its muscles and their tendons are like taut wires moved by a sort of stupid clockwork machinery from behind and needing constant tinkering to make them a little shorter or longer. The ocular dynamic apparatus is a living organ, changeable, keenly alert and marvelously reactive to stimulus and to intelligent help. I can imagine nothing more "*bête*," more unsurgical or more unmedical, than cutting the tendon of an overstrong muscle of the eye, when the weak antagonist, by physiologic methods, may in a week, a fortnight, or a month, have its strength increased five or six fold.

CHRONIC INTERSTITIAL OPHTHALMITIS.
(CHRONIC SIMPLE GLAUCOMA.)

BY S. O. RICHEY, M. D.,
OF WASHINGTON, D. C.

THE reader of the literature of glaucoma must be impressed with the regional consideration given to the subject by all writers, since the announcement of Von Graefe's high-tension theory. The whole process, and its explanation, have been confined to the ocular structures alone. In 1892,¹ the writer attempted to show *why* glaucoma should be regarded as a local expression of a diathesis. One of the ablest advocates of the retention theory (Knies), of increased intra-ocular tension, Priestley Smith, thinks "*that the high tension depends more upon an excess of blood in the eye than upon an excess of intra-ocular fluid.*" In favor of this is the *rapid* advancement of the lens and iris in acute glaucoma; the engorgement of the venal system; and the pulsation of the retinal arteries, intensified by slight pressure upon the globe; thus showing increased general arterial tension, accentuated by the added resistance to the entrance of blood into the eye.

High tension of the bulb is not glaucoma, but with the other symptoms of glaucoma, is a localized expression of a general affection, which is aggravated by violent emotion, by shock, by excess of food and indigestion, by hunger, by loss of sleep, by the climacteric, by constipation, and by palpitation of the heart; just such disturbances as aggravate this disease

¹ *Trans. American Ophthal. Society*, 1892.

expressed elsewhere in the system. Such passing conditions do not *cause* glaucoma, but they precipitate the attacks when a predisposition already exists, and the *modifications* of tension can be more readily understood, attributed to this factor, than when referred to either of the most prominent theories of high tension, that of hypersecretion, and that of retention, of the intra-ocular fluids, to each of which fatal objections exist. For, the mechanical resistance of the eyeball excludes the possibility of hypersecretion beyond the point at which the two would balance each other; and this objection stands equally against the theory of retention, as the secretion of fluids can not be continued beyond a certain fullness of the globe, which is reached more quickly if the secretions are retained. Also, the channels of excretion are often found open after the highest degree of tension, which takes place in the acute form of glaucoma, when the heart's action is usually excitedly strong, in its effort to overcome spasmodic contraction of the remote arterioles; a condition shown by the pallor of the face, followed by dilatation of the vessels and congestion of the face and head, with slight protrusion of the eyeball, and some edema of the lids, the condition in which we usually first see the cases.

The bilateral character of glaucoma must be remembered, for in nearly all cases, sooner or later, both eyes are affected in this way. Attention has already been called to its close resemblance to another local expression of the same constitutional malady in another extremity of the body, of which high tension is as constant a peculiarity, and which is accepted as due to turgescence of the blood vessels. Von Graefe believed all forms of glaucoma to have one cause, which he judged to be local, increased intra-ocular tension; by which the attempt has been made to account for all the other phases of the disease, local and general, symptomatic and anatomic; hence, much of the confusion.

Corneal opacity, which has by no means been ignored, as the reports of the vast majority of cases mention it, has not had due prominence, nor the importance attached to it, which its constant presence deserves. It is, perhaps, more constant than increased intra-ocular tension, which it often precedes;

and, in such instances can no more be due to increased tension than can disc excavation in a case in which tension has never been above normal.

To take a lesson from the affection, and begin at the beginning, is a course which is simple and logical. Donders indicated the beginning when he declared chronic simple glaucoma to be *the type* of the disease. The other forms of glaucoma have the same origin, the cause acting with a varying degree of force or virulence. Chronic simple glaucoma, the primary and uncomplicated form, is the initial localization of the process, from which arise all other forms and complications. It may be so slight that its known symptoms are not recognizable, for the disease has often developed beyond the first stage, lacking most of the diagnostic symptoms, until an added impulse has declared them; and yet, in nearly every case, there is an antecedent history of headaches, called neuralgic, which seem to start from the occiput, like the headache due to breathing coal gas. To quote Foster:²

"The dominating center of the vaso-motor nerves lies in the upper floor of the medulla oblongata. Stimulation of this central area causes contraction of all the arteries and great increase of arterial blood-pressure, with swelling of the veins and heart. Paralysis causes dilatation of the arteries and fall of blood pressure. This center may be excited directly and reflexly. * * * Psychical excitement influences this center, causing constriction of the small arteries. * * * A pale, cold, collapsed side of the face, contraction of the temporal artery like a whip-cord, *dilatation of the pupil*, and secretion of thick saliva, are sure signs of intense stimulation of the cervical sympathetic nerve, which may be brought about by some poisons, and by emotion. Lactic acid (1-10,000 saline solution) passed through the blood vessels of a frog always enlarges their caliber (Gaskell)."

Simple glaucoma has fairly constant features. Acute glaucoma is of many varieties, whose features in common are increased intra-ocular tension, advancement of the lens and iris, dilatation of the pupil, and opacity of the cornea; the variation depending upon the quantity of impulse, the special tissues involved, or upon the stage which has been reached by the chronic process, on which the acute form is engrafted.

² Foster's Text-book on Physiology, second edition, pp. 695-701.

That the acute form is propagated upon a local process already existing,* and more or less entangling the tissues of the whole organ, would seem to be supported by the irregularity and uncertainty of its development and response to measures adopted for its relief. The anatomic and microscopic changes noted, in the different series of glaucomatous eyes examined, may disagree; at times they directly contradict each other. This is not due to incapable or imperfect observation, though it causes great confusion in the mind of the student; but to the fact that the underlying process has attacked a different set of tissues, or the same tissues in varying order; has not pursued an identical course in its encroachments, or has done so with diversity of power or rapidity. Observations have included all the tissues of the eyeball. In one case, at a given period of development, the disc will be deeply cupped, while in another the excavation may be shallow, if it exists; the anterior chamber may be shallow in one case, and deep in another; tension may be the same in all; or with any, or all, of these changes it may not be increased. The sinus of the anterior chamber may be closed with normal or subnormal tension³; in another, aniridia⁴, with the filtration angle closed by the *rudimentary* iris, and with increased tension. Any combination of symptoms and conditions existing together point to two processes at work: one, chronic and constantly progressive, the other spending itself in recurring attacks of more or less violence; both due to the same influence, which manifests itself in the two ways, in different degrees, in individual cases. A remote nervous influence manifests itself when mental perturbation excites an exacerbation, or when rest and quiet are followed by an improvement in the physical symptoms.

Whatever other changes are observed, those of the cornea are nearly always present. That glaucoma may begin in the cornea there is hardly room for doubt, for repeated slight injuries to the cornea are frequently followed by acute glaucoma, as is shown by the interesting cases given below in

* May not always be apparent.

³ Schnabel, *Archiv. Ophthalm.*, Vol. VII., pp. 37, 38, 302.

⁴ Collins reports several cases, *Ophthalm. Review*, Vol. X., p. 101.

abstract; even two of Mr. Collins' three cases of aniridia with glaucoma were marked with initial corneal changes; one with central leucoma, consecutive to a perforating ulcer of the cornea, and a staphyloma in the ciliary region; another, with a corneal cicatrix and a staphyloma; the third had a glaucomatous cataract at 34 years of age.

Von Graefe⁵ reports a woman 50 years of age, with an old eczema for many years, with an opaque and swollen spot with a yellow center, in the cornea opposite the pupil. Tension, which was not tested at the time of his first interview, was normal in the fourth and sixth week. While the corneal disease remained stationary, a subacute glaucoma developed. Iridectomy relieved the glaucoma and cured the corneal affection.

Saemisch⁶ relates a case, in which a *striped* opacity of the cornea existed previous to the development of a vesicle. When the corneal trouble was at its worst, acute glaucoma supervened. Iridectomy; cure.

Pooley⁷ observed a case of keratitis vesiculosa, ending in absolute glaucoma. A Jewess, 40 years of age, left eye. The anterior chamber, fundus and field normal, V. = $\frac{2}{80}$, in August. In October, pupil wide and immovable, anterior chamber shallow, T (r) +, no perception of light, great pain. Iridectomy reduced tension and relieved the pain, but did not restore vision.

Saemisch⁸ gives another case, blind from glaucoma, in which corneal vesicles developed. The eye had to be enucleated.

Bowman reports a case of keratitis bullosa in an ill-fed woman; the eye was destroyed by glaucoma.

Landesberg⁹ details seven cases of keratitis bullosa, illustrative in this connection:

Case I. A child 8 years of age, in whom severe ciliary neuralgia, and increased intra-ocular tension, accompanied the development of each vesicle, which occurred at intervals of from eight to fifteen days. Reparation began in the deeper layers of the cornea.

Case II. A man 38 years of age; the corneal affection pursued the same course for four months, ending in acute glaucoma, cured

⁵ *Archiv. f. Ophth.*, Vol. XV., p. 108.

⁶ *Berliner Klinische Wochenschrift*, No. 37, p. 449.

⁷ *Archiv. Ophthal.*, Vol. IV., p. 46.

⁸ *Handbuch der gesamten Augenheilk.*

⁹ *Archiv. Ophthal.*, Vol. VI. p. 135.

by iridectomy, His family physician judged this man's trouble to be of *rheumatic** origin.

Landesberg thinks there is such an interdependence between keratitis bullosa and glaucoma that every eye suffering from this form of corneal trouble is liable to be seized with glaucoma.

Case III. In a man 22 years of age, ulceration of the cornea, consecutive to a foreign body (bit of metal) in the cornea, in October. Vesicles formed six times before the end of December, always announced by the presence of several small ulcerations in the deeper layers of the cornea, from which vertical parallel *stripes* proceeded. In four of the six attacks increase of tension was evident.

Case IV. A child, four years of age, with *eczema* of the head, nose and face, had frequent attacks of keratitis bullosa; irritation, pinhead infiltrations in the deeper layers of the cornea, from which proceeded vertical *stripes*; ciliary neuralgia and increased intra-ocular tension. The eye recovered with a circumscribed leucoma.

Case V. A man, 36 years of age, had frequent attacks of keratitis bullosa (seven to fifteen days interval), with the already described appearance of the cornea, and increased intra-ocular tension. He recovered with a firm cicatrix at the site of the affection.

Case VI. A man, 71 years of age, with a like appearance and condition of the cornea, anterior chamber shallow, pupil moderately dilated, increased (?) tension. Nine days later, a vesicle; acute glaucoma; iridectomy. Two weeks later, another vesicle, tension increased. Cured, with a circumscribed central leucoma.

Case VII. A girl, 20 years of age, without previous trouble. The appearance of the cornea as in the cases described; tension normal. Three weeks later, vesicles formed with increased tension. A number of attacks followed in the next four months, when the patient discontinued her visits. At the last visit, the lower part of the cornea was dim, and tension was normal.

Atropin was used in all these cases, but atropin will not *cause* increase of tension in a normal eye. A disposition to high tension must pre-exist, and its occurrence is only precipitated by the mydriatic; possibly by the retraction of the iris,† and the consequent diminished resistance to the influx

* The identity of the cause of gout and rheumatism can not be discussed here.

† Eserin acts by resisting this influx; when the *vis a tergo* is too great or too persistent, it fails.

of blood into the eye in the presence of general high arterial pressure, as shown by the tendency to intra-ocular hemorrhage if too rapid escape of aqueous is permitted during glaucoma operations. Landesberg found the best treatment of these cases to be by *scarification* and *compression*. He refers to the very rapid onset and course of the corneal phenomena, save the opacity; to the increased intra-ocular tension, which is constantly present and in proportion to the corneal irritation; to the immunity of the iris and choroid, and to the secondary (?) glaucoma.

Bullous keratitis, according to Graefe, *is one of the symptoms of a deep morbid process*. In its nature it is a herpes, and not of true inflammatory character; it is an expression of irritation at the origin, or in the course, of a nerve, an evidence of which we have in the neuralgic pain inseparable from the development of the vesicles. The periodicity of its recurrence (seven to fifteen days) suggests an irritation of chronic character, and in this is supported by its apparent kinship to herpes preputialis, which has the same history, expresses itself in the same manner, runs the same course, and of whose origin there is no doubt; lithemia. The vesicles may precede the development of glaucoma, and be of some prognostic import; they may develop only in the stage of glaucoma degeneration. Appearing thus at widely different stages of this disease, the two must be due to the same cause, and form part of the same process.

Landesberg¹⁰ further relates two cases of *ribbon-shaped* keratitis (?) followed by glaucoma, which are not without interest.

Case I. "A man, 60 years of age. When first seen, the right cornea was the site of a wide ribbon-shaped and continuous opacity, corresponding to the palpebral fissure, and extending transversely over the whole cornea. The opacity was a *reddish-brown*, and had an equal degree of color intensity from the margins to the center of the cornea. The center itself appeared whitish-gray, as if a metallic salt had been precipitated there. The ribbon-shaped opacity had a sharply defined boundary above and below." Photophobia, tension normal, pupil reacted sluggishly to atropia; ophthalmoscopic exam-

¹⁰ *Archiv. Ophthalm.*, Vol. III., p. 65.

ination impossible. The left eye showed the first stage of the affection; near the inner and outer margins of the cornea, a narrow opaque stripe of slightly brown shade. The opacity had the appearance of a thin stripe of brown color, laid quite superficially on either side of the cornea with the most delicate touch of a brush; the center of the cornea clear. He rejected an iridectomy on the right. Three months later he returned. The right eye was *hard*, with a shallow anterior chamber, posterior synechia, perception of light, subconjunctival injection; corneal opacity unchanged. Iridectomy with good result. Three years later, there was no irritability, tension normal, and the corneal opacity had a tendinous appearance, having gained so much as to leave a very narrow rim of clear cornea.

Case II. A man, 55 years of age. When he presented himself, the right eye was the seat of subacute glaucoma. All the phenomena of glaucoma were present, with numerous hemorrhagic spots in the retina. The cornea was affected with ribbon-shaped opacities, brown in color; the corneal epithelium was smooth and shining. Iridectomy reduced the tension and cleared up the hemorrhagic spots, and the eye remained in a satisfactory condition, with no gain in the ribbon-shaped opacity, a year later.

Hirschberg¹¹ records a case of acute glaucoma, following the use of atropin, in "an apparently healthy lady," 64 years of age. He found "fine maculæ cornearum centrales of *old date* and punctate opacities of the front surface of the cornea." Atropin was used after iridectomy without mischief, and H. raises the question if glaucoma malignum belongs to the eye or the individual.

In but few of the cases cited above was the cause suggested for the corneal changes observed. A notable exception was that in which a bit of metal excited the changes which followed; and yet a constitutional predisposition existed, or the formation of vesicles would occur more frequently from foreign bodies in the cornea. This predisposition was probably "rheumatic," as suggested by the physician in another of the cases.

The cornea may be measurably tolerant of injury, but just what persistent mechanical irritation will accomplish (if that alone did it) is shown by the cases reported by Dr. Hock,¹² of Vienna, almost in the nature of an experiment.

¹¹ *Archiv. Ophthalm.*, Vol. IV., p. 203.

¹² *Archiv. Ophthalm.*, Vol. V., p. 382.

"A right eye had been lost six months previously from Egyptian ophthalmia, leaving a dense cicatrix in place of the cornea. Fingers could be counted at 2 feet, tension normal. The cornea was tattooed, and during the evening there was severe pain on the right side of the head, extending from the eye. Next day the bulb was of stony hardness. A former corneal fistula was reopened, and the globe immediately became quite soft. Tension was increased four times during the treatment; each time the lens was advanced, with bulging of the middle part of the scars.

"The curative effect of artificial interference after each relapse (opening the fistula), and especially the recovery and persistence of normal tension after the last sitting (when the fistula was again reopened) proves to me that in this eye there were none of the conditions (!) predisposing to glaucoma, but that the effect was due entirely to the multitude of little wounds."

"Irritation of the cornea is sufficient, without mediation, to give rise to glaucomatous increase of tension" (Von Gräfe). Hock adds the case of a stout woman, 54 years of age, with palpitation of the heart, whose right eye had been lost a year before by glaucoma. "Just below the middle of the cornea was found a circular opacity as large as a hemp seed. Evidently there had been circumscribed corneal infiltration preceeding the glaucoma which had now passed by. Considering all the circumstances developed by the history of the right eye, we can hardly avoid the conclusion that here was a succession of corneal infiltrations, with consequent glaucoma."

Mauthner¹³: A man, 71 years of age, injured by powder explosion a long time previously. In youth, he had some inflammation, which left several facets as large as a pin's head, stretching across the area of the pupil. Acute glaucoma of the right eye, with remarkable *striped* haziness of the corneal parenchyma; left eye hazy from an *old* parenchymatous grayish-white and striped cloudiness. Sclerotomy, and the stripes became squares, so that forty-eight hours later the cornea looked like a chess board, the stripes giving way to squares, which disappeared in a week. Fourteen days after operation the cornea was perfectly transparent except for the old central facets; cured.

Mauthner (*Loc.cit.*): A man, 64 years of age. Glaucoma simplex. Both eyes had been struck by the bowstring of a mouse trap a year before. Both corneæ faceted; pterygium covers the pupil of the right eye; circular abrasion of the left cornea, upward and outward.

¹³ *Loc. Cit.*, Vol. VII., p. 224.

Tension moderately increased. Iridectomy of the right eye; sclerotomy of the left. Tension notably lessened.

Mauthner (*Loc. cit.*, p. 235): Man, 74 years of age, with both corneae cloudy in distinct parenchymatous spots, which look like the remains of previous inflammation. Increased tension. R. V. = $\frac{1}{2}$; L. V. = $\frac{1}{4}$; F. F. free. Sclerotomy. Tension normal; spots in the cornea unaltered; vision unchanged.

Idem: Boy, 6 years of age; blow on the head; traumatic cataract of the left eye and glaucoma of the right eye. T. + 3, globe very large. Cornea cloudy in *stripes*, diameter of the cornea = 18 mm., disc deeply cupped; no pain; no perception of light. Sclerotomy. T —; fingers at 10 feet. Left cornea clear, diameter = 15 mm. (3 mm. less than that of the glaucomatous eye).

Schöler¹⁴ produced glaucoma experimentally by burning the cornea. This was probably due to the irritation of the cornea, and the consequent disturbance of the normal supply of corneal nutritive elements or to reflex nerve influence upon the vaso-motor "dominating center" in the floor of the medulla.

Dr. Elizabeth Sargent¹⁵ made an anatomical dissection of six eyes enucleated for absolute glaucoma. She found *pannus of the cornea in all*; superficial ulceration in one; masses of round cells about the scleral and episcleral vessels, or in the cornea, in all; sinus of the anterior chamber patent in three; closed in two; partly open and partly obstructed in one; iris atrophic, and adherent to the cornea, in all; Descemet's membrane pierced by inflammatory tissue (showing *how* this membrane may not *always* be intact), in one; retina atrophic, and detached, in three; with sclerosis of the arterial walls in three; optic nerve excavated, with connective tissue hypertrophy, or cellular infiltration of the nerve, and atrophy of the nerve, in all.

It is with difficulty that an abstract is made of such a detailed examination and reference is made to the paper. The examination was very pains-taking and offers evidence of the constancy with which corneal structure changes, cellular infiltration into the corneo-scleral region, and into the optic nerve and its sheath, and connective tissue hypertrophy, are met. These are the ultimate features of the structure changes,

¹⁴ *Berliner Phys. Gesellschaft*, June 20, 1879.

¹⁵ *Centralb. für Augenheilk.*, December, 1884, p. 353.

for, in these cases, the malady had already run its course. To specify all the changes that had taken place at any particular period of its progress is manifestly impossible, as they can not be just the same in any two cases, and thus give rise to a diversity in the severity of the symptoms, and of the result of a given operation, in different cases. This examination seems to have been made with no purpose to support a preconceived theory, and is reliable.

The examination of seven glaucomatous eyes by Birnbacher and Czermak¹⁶ is of much the same character as the preceding, only it shows how persistently an accepted view possesses the mind. The four, first in order, had chronic inflammatory glaucoma; the next was one of hemorrhagic glaucoma; the last two, of glaucoma degeneration.

Case I. Cornea rough and exfoliated; T. + 2; slight edema of the corneal structure; slight rupture of Bowman's membrane, and two or three-fold layers of spindle cells between it and the pavement cells; spindle-form, and large groups of round cells, with single epithelioid cell forms about the episcleral veins. Cell infiltration into Schlemm's canal, membrane of Descemet, iris, ciliary body, choroid, in the sclerotic-choroid about the papilla; and masses of them rest in the perivascular spaces, and take on the form of young granulation tissue. The choroid is thinned about the papilla. An exuberant growth of endo-epithelium was found everywhere in the intervascular space.

Case II. Retina and choroid adherent in places. Pavement cells of the cornea destroyed. Bowman's membrane broken through, and epithelium thickened. In the upper layer of the corneal structure, and in Bowman's membrane, was found a thick, fibrous, richly nucleated tissue, having vessels, and penetrating the surface of the membrane, always at least to the extent of the area of the membrane. This tissue was found between Bowman's membrane and the epithelium, and in the epithelium, causing small *elevations* of its surface. Blood vessels extended to the center of the cornea, and along them thick rows of round and spindle cell nuclei. The canal of Schlemm was effaced. Fibrous connective tissue was found on the surface of the iris; the retina, posterior to the ora serrata *was greatly thickened, and changed into an irregular meshwork of coarse and fine fibers*; the posterior choroid thin and adherent to the

¹⁶ Graefe's Archives, Vol. XXXII, 2, pp. 1 to 75.

sclera; nuclei of the optic nerve neuroglia increased in number; about the central vein a mass of granulation cells.

Case III. Relation and position of the cells of the pavement epithelium of the cornea changed. No edema. Between the corneal epithelium and Bowman's membrane was found a tissue of coarse fiber bundles, and numerous long spindle-form nuclei, supplied sparsely with vessels, and extending over the whole cornea. Bowman's membrane was broken through in many places by lines of spindle cells, which sink into the corneal structure. Scleral and epi-scleral vessels extended forward through all the layers. The corneo-scleral sinus was almost obliterated. In the anterior section of the corpus vitrei were numerous wander-cells.

Case IV. A hemp-seed sized sclerectasia; in the corneal epithelium were circumscribed small prominences; between Bowman's membrane and the epithelium the space was filled with a fine mass of *striped* network. Slight edema.

Case V. In the corneal substance, especially near the periphery, and in the deeper layers was found a coarse *network* whose contents were invisible: membrane of Descemet intact.

Case VI. Edema of the cornea, and colored nuclei. Bowman's membrane broken through by spindle-shaped cells.

Case VII. A woman, 75 years of age, with high arterio-sclerosis and irregular heart action; urine normal. Pericorneal injection, keratitis punctata, cornea uneven, anterior chamber abolished. In the cornea fine granulation masses were found in the epithelial spaces. Glaucoma pannus; spindle-celled formation in the corneal substance.

It will be seen that the new-formed connective tissue was found in all these cases and in more than one structure, but especially marked and general in the cornea.

I have herein referred to no cases of my own, for, in the language of Mooren, "I prefer to call attention to the statements of other observers rather than to mention cases of my own practice, in order to leave no room for the insinuation that my observations are biased in favor of a certain pathological view, thus bringing into connection with each other things which may be only the result of accident."

I would say further, that, for obvious reasons, I have avoided reference to the "steaminess" of the cornea, which is always manifest in acute glaucoma, and which may, or may not, be due to edema of the cornea from increased intra-

ocular tension, as claimed by Fuchs¹⁷; nor to the arcus senilis (the early result of the affection of the corneal nutrient vessels, as the ulceration, or necrosis, of glaucoma degeneration is the late development) so often present in glaucoma; nor to the lenticular changes, though Rheindorf describes glaucoma with *acute* opacity of the lens, the cataract being incipient when the glaucoma developed. I would suggest that a closer relation exists than is realized, between the *cause* of glaucoma and the *cause* of senile cataract.

Angelucci¹⁸ thinks that glaucoma is due to scleroses of all the membranes of the eye, and especially of the walls of the blood vessels, as he found the arteries sclerosed, their caliber diminished, and the veins swollen and chronically inflamed.

Steamy opacity of the cornea may precede increased intra-ocular tension, and two weeks may be required for its disappearance after tension is reduced. It is an open question, if fluid from the anterior chamber can penetrate to the corneal lamina while the membrane of Descemet remains uninjured. The cases referred to show true corneal tissue changes, often of some duration when the glaucomatous attack developed: stripes, brown ribbon shapes with smooth and shining corneal epithelium, chess-board squares, vesicles, facets and leucoma; which differ greatly from the possible appearance of an intralaminar edema, with rough and desquamating corneal epithelium. Fuchs and others have seen intralaminar edema, and it, therefore, sometimes occurs, but only when the membrane is deficient at some point, as in Sargent's case, in which Descemet's membrane was perforated by inflammatory tissue. A few cases, however, do not show that the corneal opacity is due to edema from high tension. It *may* happen so, and another form of deficiency in the membrane of Descemet by which edema of the cornea from the interior of the eye may occur is shown by Tartuferi,¹⁹ who, in a microscopic examination of the corneæ of a collection of glaucomatous eyes, found in most of them tissue changes of important character: shortening of the corneal diameter by connective tissue between

¹⁷ *Graefe's Archives*, Vol. XXVII., 3, p. 66.

¹⁸ *Trans. Internat. Med. Cong.*, London, 1883.

¹⁹ *Gior. di R. Acad. di Med. di Torino*, Nos. 5 and 6, 1882.

the epithelium and the membrane in the periphery of the cornea; the presence of wander-cells which are easily changed into connective tissue; the epithelium often separated from Descemet's membrane by connective tissue, etc.

Here again we find corneal changes which are of the same character as those noted in the other structures of the glaucomatous eye, for by anatomical and microscopical examinations connective tissue has been found in the ciliary nerves²⁰, muscle,²¹ and processes,²² the cornea,²³ the iris,²¹ the choroid²⁴, the retina,²⁵ and the optic nerve.²⁶ Fuchs,²⁷ himself, from the dissection of the eyes of a woman, dead at 64 years of age, which had been iridectomized for acute glaucoma eight years before, in which the lamina cribrosa was only slightly convex backward, with atrophy of one-fourth of the optic nerve fibers, concludes that simple hyperplasia accounts for the changes in the ciliary body, as they seem to have existed *before* the glaucoma, and to have excited the attack. Connective tissue hypertrophy was most marked in the region of the macula.

Schnabel²⁸ thinks opacities of the cornea do not depend upon increased tension, and that they are only a symptom; that they are not of inflammatory character in the sense of a keratitis, differing so much in appearance, some being dotted, some ribbon-shaped, and others diffuse, occupying the whole corneal tissue. Yet, some of them have as much of the character of inflammation as the so-called inflammatory glaucoma; we do not see *pus* associated with either. It is true that ulcers and abscesses of the cornea in absolute glaucoma, are sometimes accompanied by hypopion, but only as

²⁰ Hocquard, *Archiv. d' Ophth.*, Vol. III., No. 3

²¹ Stoltz, *Graefe's Archiv. f. Ophth.*, Vol. XXXIV.

²² Bralley, *Royal Lond. Ophth. Hosp. Reports*, Vol. X., p. 86.

²³ Birnbacher and Uzermak, *Graefe's Archiv.*, Vol. XXXII, 2.

²⁴ Knies, Ueber das Glaucom., *Archiv. f. Ophth.*, Vol. XXII., p. 163.

²⁵ Schnabel, *Archiv. Ophthal.*, Vol. VII., p. 307.

²⁶ Alt, *Lectures on the Human Eye*, p. 156.

²⁷ *Graefe's Archiv.*, Vol. XXX., p. 123.

²⁸ *Wien. Med. Presse*, 22-26.

a result of necrosis, for the glaucomatous character of the affection has about ceased. It would, therefore, seem proper to attach to the corneal changes, observed in glaucoma, their true importance as *part of the process* instead of trying to account for them as a result of increased tension, a superficial view which the evidence does not justify. If, however, they *must* be regarded as a symptom, let it be as a symptom manifested in the cornea, exposed to view, of a tissue change progressing elsewhere in the structure of the eye, out of view; in the sclerotic. The epi-scleritis, which often fore-shadows a glaucoma, favors this view.

Dr. J. Kostenitch²⁹ reports the microscopic examination of a case of scleritis:

"A woman, 24 years of age, left eye blind, *larger* than the right and sensitive to pressure; Tn. Entire cornea a white scar. Optic disc excavated; anterior chamber shallow; iris atrophic, and adherent to the cornea at its periphery. Sclera, cornea, conjunctiva, iris, ciliary body and vitreous affected by cellular infiltration, and occupied by numbers of wander-cells (leucocytes); detachment of the membrane of Descemet; disappearance of Bowman's membrane; new-formed tissue in the anterior chamber, and the corpus vitrei, the fibrillæ being well marked; thickening of the walls of the arteries in the ciliary body and choroid; atrophic degeneration of the retina."

This is a typical picture of glaucoma, lacking the feature of high intra-ocular tension. It could not be examined ophthalmoscopically because of the corneal opacity, and was designated *scleritis* from the most prominent clinical symptom of active localized disturbance.

Thus, instead of being a consequence of increased tension, the process which it shows to be in action is the probable cause of high tension, and all the other symptoms for which high tension has been held responsible. By reflex action through the vaso-motor center in the medulla oblongata, either from the encroachment of new connective tissue upon the ciliary and other nerves of the bulb, or by the excitement of these same nerves by an irritant contained in the blood; or by the direct influence of this irritant itself upon the vaso-motor

²⁹ *Archiv. Ophthalm.*, Vol. XXIII., No. 4, p. 416.

center, causing contraction of the arterioles and increased heart's action (palpitation) to overcome the added resistance to the onward motion of the blood-stream, with consequent high arterial pressure and venous stasis, followed by dilatation of the arterioles in reaction, and the symptoms of inflammation, is the picture presented by irritative and inflammatory glaucoma, with increased intra-ocular tension, often relieving itself without interference, though not perhaps until visual power is abolished. A continued high tension is due to persisting venous stasis, as when tension *slowly* falls to the normal, after operation. If high tension depended upon the occlusion of the channels of filtration, nothing but mechanical interference would relieve it, when once "the vicious circle" had been formed; but we know that *passing attacks* of high tension are frequent. Eserin is effective in emptying the veins by the *spasmodic* pressure exerted by the iris muscle in its efforts to contract the pupil, and hence the greater efficiency of the weaker solutions, as a strong solution of eserine causes *rigid* contraction* of the iris.

High intra-ocular tension, due to the increased amount of blood in the vessels of the bulb, explains those cases in which the sinus of the anterior chamber is open, the variations of tension so common in *irritable* glaucoma, the advancement of the lens and iris, and the shallow anterior chamber; it accounts for a *hardness* of the globe which may at least balance the *vis a tergo*, the general blood pressure.

"When connective tissue is being supplied, the part becomes inflamed and swollen, owing to the exudation of plasma. The blood vessels become dilated and congested, and, notwithstanding the slower circulation, the *amount* of blood (in the part) is greater. The blood vessels are increased owing to the formation of new ones. Colorless blood corpuscles pass out of the vessels and reproduce themselves, and many of them undergo fatty degeneration, while others take up nutriment and become converted into large uninucleated protoplasmic cells, from which giant cells are produced."³⁰

Vascular disturbance is essential, but however this may be, connective tissue germination is wont to be accompanied by

* Perhaps well-devised manipulation of the eyeball would relieve tension. I have not tried it.

³⁰ *Foster's Text-book on Physiology*, 2d Ed., p. 405.

edema, and would be a more natural explanation of the edema of the cornea described by Fuchs.

Atrophy of the choroid, appearing earliest about the optic nerve in which an extra growth of connective tissue is so generally found, gives some color to Mauthner's³¹ view:

"That glaucoma is a serous choroiditis by which vision is destroyed, and not by high intra-ocular tension; as the worst cases are those in which tension never rises above the normal."

The observation of Straub,³² that when a meridional section of a glaucomatous eye is made, the choroid is found to have lost its elasticity, and does not withdraw from the sclera as in the healthy eye, is offered in evidence of its sclerosis, and its atrophy is due, at least in part, to this condition. Ulrich³³ regards sclerosis of the iris and infiltration as the two great factors in the pathogenesis of glaucoma, and Heyne³⁴ found in chronic glaucoma hyaline degeneration of the vessels. Valude³⁵ reported observations in four cases of hemorrhagic glaucoma, all of which gave evidence of arterio-sclerosis. The retinal vessels showed hyaline degeneration and peri-vasculitis. Optic nerve cupping, and closure of the iris angle were not always found, but dilatation of the iris and ciliary bodies was constant. He thinks this form of glaucoma due to an alteration of the retinal blood vessels, secondary to a disease of the general vascular system. Garnier³⁶ judges the compensatory endarteritis of glaucoma to begin in degenerated hyaline, or connective tissue masses between the elastic membranes. Schnabel³⁷ did an iridectomy on two eyes. There was nothing remarkable in the left; but from the right eye, with and behind the iris, a grayish mass prolapsed, which proved to be "a thin whitish membrane, pervaded by delicate straight and somewhat tortuous connective tissue fibrillæ, and containing a few elastic fibers, numerous larger and smaller blood vessels filled with red blood discs; around these a larger quan-

³¹ *Wien. Med. Bl.*, 10, p. 300.

³² Report of Seventh International Ophth. Congress, Heidelberg, 1888.

³³ *Trans. Ophthal. Society*, Heidelberg, 1884.

³⁴ Inaugural Dissert., Königsburg, 1884.

³⁵ *Trans. Ophthal. Society*, Heidelberg, 1892.

³⁶ *Archiv. f. Augenheilk.*, Vol. XXV.

³⁷ *Archiv. Ophthal.*, Vol. VII., p. 277.

tity of fibrillar connective tissue, in which numerous cells were imbedded. * * * The exsected iris was thinner than normal." Prof. Jaeger had a similar experience in three iridectomies, and Dr. Kerzendorfer, in one. Schnabel²⁸ also reports sixteen, or more, cases of glaucoma, in all of which he found structure changes of the cornea (a cicatrix, an ulceration, or a staphyloma), or sclera, and closure or obstruction of Schlemm's canal, though some of them did not show increased tension. In some instances an increase of connective tissue was found in the ciliary muscle; and atrophy of the ciliary body first observed by Brailey,²⁹ exists in the great majority of cases of simple glaucoma, sometimes even before the glaucoma is manifest.

While only a portion of the recorded evidence is here offered, it would seem sufficient to establish the claims of this and a preceding paper (*The Disease Process, Glaucoma, American Jour. Med. Sci.*, June, 1893) that the local affection is a fibrosis, or connective tissue hyperplasia which, by the growth of the degraded tissue chokes to death the special functional tissues. The testimony of the eminent observers favors the further contention of this paper that the corneal appearance is *not symptomatic* of high tension, but is an organic change, shared in common with the other parts of the eye, especially with the sclerotic, whose density and opacity deny to us the observation of such slight manifestations as may be detected in the normally transparent cornea.

Repeating that it is the *type* of the disease, primary simple glaucoma, the basis of the varieties, which is under consideration, and recognizing that the evidence may not be conclusive to some minds, perhaps, because it has been lamely presented; or, because, from a long acceptance of the idea that high intra-ocular tension and glaucoma are almost synonymous, mental adaptability to any other view is impossible, the paper proceeds to the question:

What are the factors which most probably promote connective tissue hypertrophy?

Some of them have been named in the preceding pages.

²⁸ *Archiv. Ophthalm.*, Vol. VII., pp. 24 to 33 and 249 to 257.

²⁹ *Royal Lond. Ophth. Hosp. Rep.*, Vol. IX, 2, p. 199.

The chief examples of overgrowth of connective tissue in organs of high functional character are interstitial hepatitis, interstitial nephritis and sclerosis of the spinal cord.

Interstitial hepatitis may begin in a primary degeneration process, or in an irritative congestion. In either case cell degeneration seems to be the process, *and is often preceded by pain and enlargement for three or four years before the establishment of the sclerosis.* It may be secondary to malarial (?) hyperemia; due to abuse of alcohol; to diffusion of degenerative processes (as others coexist) which cause hypertrophy first, and are not inflammatory (Handfield Jones). It has been seen as early as 10 years of age (Frerichs). The morbid process involves extravasations of blood, complete destruction of the secreting structures, and disintegration and *partial absorption* of the component tissues of the organ.

Interstitial nephritis was shown in my paper, "The Disease Process, Glaucoma," to bear a close resemblance to glaucoma in its clinical history; in anatomical features it is of the same type. The *capsule* is less *transparent* than normal, with small vessels ramifying on its surface. In laying open the organ, the cut surfaces become convex, showing compression of its elements (tension). If the process is recent, the tissues are friable; if connective tissue overgrowth has taken place, the tissue is tough. There may be an accumulation of small round cells, and multitudes of new cells lying without their capsules.

Semmola⁴⁰ claims that true interstitial nephritis always consists in a general nutritive disorder, to which nephritis is secondary; beginning in diminished cutaneous respiration, followed by the imperfect digestion and transformation of albuminous foods. Palpitation of the heart, without organic change, conjoined with atonic or irritative dyspepsia is often found; observed in children as a heredity. A. Weber⁴¹ found heart disease in all young persons having glaucoma, and that iridectomy served little purpose in such cases.

Sclerosis of the cord is a process of degeneration, though it may develop with some rapidity with symptoms of second-

⁴⁰ *Gazette Medicale de Paris*, 1875.

⁴¹ *Graefe's Archiv.*, Vol. XXIII., No. 1.

ary degeneration; it is a primary irritation, with consecutive connective tissue proliferation (increase of neuroglia), and absorption of nerve fiber. *Causes:* Inherited tendency, constitutional syphilis, possibly sexual excesses, chronic alcoholism, repeated over-exertion and exposure to cold, and lead poisoning.

Thus, according to the most trustworthy views, connective tissue overgrowth is due to *dirty* blood; made so by imperfect digestion⁴² (to which the habitual use of alcohol contributes), so-called struma, syphilis,⁴³ lithemia and lead poisoning; by the retention of effete matter and partially metamorphosed ingesta, through the inefficient action of the excretory organs. And glaucoma is found conjoined with albuminuria, eczema, palpitation of the heart, general high arterial tension, and constitutional syphilis; in fact with all the conditions which are supposed to foster the propagation of retrogressive tissue in organs of high functional value. Observation shows that excretion by the skin is very imperfect; that most of those who suffer from glaucoma have been accustomed to take cold still baths, thus increasing the contraction of the superficial arteries, and without the exercise which restores the circulation; and they eat too much for the waste they effect, and are habitually constipated.

It is claimed that high arterial tension is never absent in glaucoma, is always found in vaso-renal changes; is due to a chronic irritant of low intensity, in action through a considerable period of time; that it is the expression of Nature's effort to rid the circulation of the irritating element, and that it is always accompanied, or followed, by connective tissue hyperplasia.

The term *glaucoma* has had no real significance since the invention of the ophthalmoscope, and conveys to our minds no idea of the disease; hence, the substitution of the term *interstitial ophthalmitis*, descriptive of the pathologic changes common to all the structures of the globe.

⁴² "There is hardly any condition which is more certain to produce intense uric-acid-edemia than gastric catarrh." (Haig.)

⁴³ Within the past three years, I have seen two cases of simple glaucoma, clearly due to constitutional syphilis.

PROGNOSTIC SIGNIFICANCE OF ALBUMINURIC RETINITIS.*

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IT seems to be generally admitted that the retinitis, following scarlet fever and pregnancy, is not of special prognostic significance as to vision or mortality, for under treatment recovery of both vision and health are not unusual in these cases. Therefore in this paper such cases have been excluded as the prognosis is altogether different and unfavorable in the retinitis of chronic Bright's disease.

Though improvement of vision very frequently occurs in albuminuric retinitis, it is of minor importance in comparison with the life of the patient and the main point which I wish to determine is the average duration of life after the appearance of retinitis from renal disease. The statistics heretofore published upon this subject deal mostly with hospital cases in which the duration of life rarely exceeds one year. Occasionally we see reported a case in private practice which has survived five, ten and even fifteen years. (Noyes mentions one of ten years, and Webster reports the case of a minister who survived seventeen years.) This led me to think that we might be able to give a more hopeful prognosis in cases which could receive good medical attention with the proper hygienic

* Read before the Section of Ophthalmology, American Medical Association, Baltimore, Md., May 8, 1895.

surroundings, etc. And I decided to try and find whether or not the average duration of life was greater among private patients than among hospital cases. With this end in view a few weeks ago I requested quite a number of Ophthalmologists throughout the country to report the cases which had occurred in their private practice to me. The time allowed was too short for many to look over their records, and many had not kept trace of the patients, after referring them back to the family physician, but enough cases were reported to show that the duration of life is much longer among private patients, and that the renal affection is undoubtedly influenced by the hygienic surroundings. However, the number of cases surviving two years was disappointingly low, and the consensus of opinion, as shown by the following extracts from letters received, seems to be that nearly all prove fatal in less than two years.

Dr. G. E. de Schweinitz, of Philadelphia, says, "So far as I know there is no case in my private practice that has lived longer than two years after the development of the retinitis."

Dr. J. L. Thompson, of Indianapolis, says, "Have had between fifty and one hundred cases scattered through my books in a private practice of twenty years. Several of my patients have died within thirty days, while others have lived two years. Many more die within six months after its manifestation in the eye than live after that period."

Dr. Walter B. Johnson, Patterson, N. J., says, "In many cases the retinitis was the first indication of kidney disease, which, after discovery, almost invariably progressed very rapidly."

Dr. Peter D. Keyser, Philadelphia, says, "That the length of life depends upon the retinal appearance at the time of first examination. In well marked cases I should say an average of twelve months, if the patient is under good medical care. I have had some cases to run two years, others only three months."

Dr. L. A. W. Alleman, Brooklyn, N. Y., says, "Save in cases due to pregnancy, I have never seen a pure case of albuminuric retinitis last over a few months from the time it has come under my observation."

Dr. Samuel D. Risley, Philadelphia, says, "My impression is that after the appearance of eye symptoms nephritis is rapidly fatal. I recall cases of death occurring within a few weeks, and cannot recall one which did not prove fatal inside of two years, whether associated with pregnancy or not."

Dr. G. C. Savage, Nashville, Tenn., says, "My recollection of these cases is that they die within two months, and I do not remember a single case that lived longer than five months."

Dr. Charles W. Kollock, Charleston, S. C., says, "In no case in my practice has any such patient lived out the year."

Dr. Peter A. Callan, New York, says, "My impression is that the great majority die under two years after the onset of the retinal changes, but there are exceptional cases, one of which has now lived nine years since I first made out that she had the kidney trouble with the eye complication."

Dr. George T. Stevens, New York, says, "I observe that some of our colleagues think that a fatal termination is to be expected within a few months after the discovery of the albuminuric retinitis. I can recall to mind quite a number of people who have survived several years. Mrs. K. survived more than eleven years after I found well marked retinitis albuminurica. This is not, I think, a specially exceptional case."

Dr. David Coggin, Salem, Mass., says, "Of thirty fatal cases I remember but two who lived over six months."

Dr. C. S. Turnbull, Philadelphia, says, "My experience has, in a general way, led me to think that the time is most variable, depending greatly upon the many and varied forms of renal disease in different individuals."

From all the statistics I have been able to find we get the following results: Cases in private practice 155, of these 62% died within one year; 85% in two years, and 14% lived more than two years.

Hospital cases 77, of these 85% died within one year, 93% within two years, and 6% lived more than two years.

Mixed cases 187, of these 65% died within one year, 93% within two years, and 6% lived more than two years.

Total number of cases 419, of these 72% died within one year, 90% within 2 years, and 9% lived longer than two years.

DIED WITHIN TIME DESIGNATED BELOW.									
PHYSICIAN.	Total Cases.	8 Mos.	6 Mos.	12 Mos.	18 Mos.	2 Years.	Over 2 Years.	Living after 1st observation.	
Dr. J. H. Thompson, Kansas City	15			13				{	1-7 months 1-2 months
Dr. W. V. Marmion, Washington, D. C.	10				10				
Dr. Hiram Woods, Baltimore, Md.	4	1						{	1-6 months 1-5 months 1-18 months
Dr. William Cheatham, Louisville, Ky.	9	1	2	2	2	2			
Dr. George T. Stevens, New York	1						1-11 years		
Dr. S. C. Ayres, Cincinnati	2	1	1						
Dr. G. H. Good, Cincinnati	1					1			
Dr. J. A. Spaulding, Portland, Me.	6	1	2	1		2			
Dr. H. B. Young, Burlington, Ia.	3	2					1-5 years		
Dr. David Coggin, Salem, Mass.	30		28				2		
Dr. Richmond Lennox, Brooklyn, N. Y.	2	1	1						
Dr. P. A. Callan, New York	1						1-9 years		
Dr. W. F. Mittendorf, New York	6	3	1		1	1			1-8 months
Dr. E. C. Rivers, Denver, Col.	3			2					
Dr. R. J. McKay, Wilmington, Del.	11		5	3			1-3½ years		
Dr. E. Oliver Belt, Washington, D. C.	2		2						
Total	106	10	42	21	15	6	6	6	6
Total.	Deducting the six cases not traced two years 15% 42% 21% 78% 94%.	10% Died	42% Died	21% within one year	15% 78% 2 years	6% leaves 6%	the following: 6%		

PHYSICIAN.	DIED WITHIN TIME DESIGNATED BELOW.							Living after 1st observation.
	Total No. of Private Cases.	8 Mos.	6 Mos.	12 Mos.	18 Mos.	2 Years.	Over 2 Years.	
Dr. G. Hartridge.....	5	1	1	3				
Dr. James Anderson.....	8	2	1	1	1		{ 4-3 years 2-8 years 10-2 to 5 years	
Dr. Simcoe Snell.....	8	3	3	19		4	6	10 two to five years
Dr. Possaner & Haab.....	39							
Dr. E. Oliver Belt.....	100	10	42	21	15	6		
Total.....	155 Died	16 within Died	47 one year within	44 62% two	16 years	10 85%	22 14%	
Hospital Cases								
Dr. Miles Miley.....	45	26	11	5 24	3	3		3 over two years. 1 less
Dr. Possaner & Haab.....	33							
Total.....	78 77- Died	26 1 case within Died	11 not traced one year within	29 85% two	3 years.	3 98%	5 6%	
Mixed Cases.								
Dr. C. S. Bull.....	108	16	14	27	7	11	{ 6-3 years 4-4 years 1-6 years 1-7 years	14 six months 2 one year
Dr. Gruening.....	Deducting 16 cases not traced	16 16	14 14	years 27	leaves: 7	11 100	12	
Total.....	187 Died	16 within Died	14 one year within	27 65% two	7 years	111 93%	12 6%	
Private.....	155	16	47	44	16	10	22	
Hospital.....	77	26	11	29	3	8	5	
Mixed.....	187	16	14	27	7	111	12	
Total.....	419 Died	58 within Died	72 one year within	100 72% two	26 years	124 90%	39 9%	

THE RECONSTRUCTION OF THE LID BORDER IN ENTROPIUM OF THE UPPER LID.¹

By F. C. HOTZ, M. D.,
OF CHICAGO.

THE correct position of the eyelashes is so thoroughly dependent on the presence and correct position of the free border that no operation which fails to reconstruct the lid border, can successfully and *permanently* remove the entropium.

As long as the tarsus possesses its normal elasticity the inverted border can be turned back to its normal position by the operation I introduced in 1879.² But in the higher degrees of entropium the tarsal cartilage has suffered such structural changes that it has lost its elasticity; and its rigidity, then, is a serious obstacle to the reposition of the free border. Under these circumstances the reposition is possible only if a wedge-shaped piece is removed from the cartilage just above the line of the eyelashes, the excision being made in such a manner that the apex of the wedge-like wound is located near the mouth of the Meibomian glands.³

This grooving operation, however, can be carried out successfully only if the tarsus is large and thick enough to allow the removal of a wedge of the requisite size, but in the worst forms of entropium the cartilage is often shrunk to a small and thin plate which offers a very poor chance for the

¹ Clinical lecture at the Chicago Polyclinic, May 29, 1895.

² See *Archiv. f. Ophthalm.*, Vol. viii, p. 249.

³ See my paper read before the Ninth International Medical Congress, 1887.

proper grooving operation. In such cases skin grafting can help us over the difficulties; for if we cannot turn back the whole inverted lid border we may turn up its anterior edge containing all the eyelashes and support them in their correct position by the implantation of a strip of skin forming a new or artificial lid border.

The first attempt at creating an artificial lid border is found in Spencer Watson's operation 1873; from this crude beginning the operation has gradually been improved by a process of evolution in the various transplantations suggested by Gayet, Dianoux, Jacobson, and many others, and has finally reached its present simple and perfect form by the use of skin grafts.

I perform the operation in the following manner: The lid border is split by the well-known intermarginal incision, which is made so deep that the anterior edge of the lid can be turned up with perfect ease. Now I make a transverse incision through the lid skin and orbicularis muscle just below and parallel with the upper line of the tarsal cartilage, excise the strip of muscular fibers which cover the upper border of the cartilage, and unite the lid skin with the upper border of the cartilage by three sutures. One suture is placed at the center of the wound, and one at either side of the central one. Each suture passes through the edge of the lid skin, then through the upper border of the cartilage and finally through the upper edge of the skin wound. When these sutures are tied the lid skin is drawn upwards and fastened to the upper border of the tarsus. This traction upon the lid skin is sufficient to cause a thorough eversion of the anterior edge of the split lid border, and when the anterior edge is thus turned up and separated from the posterior edge the intermarginal incision becomes a gaping wound several millimeters in depth and with sloping sides. This groove is to be filled by a skin graft, which must be thicker than a Thiersch shaving, long, narrow and somewhat wedge-shaped. Sometimes I have used for such grafts a narrow strip trimmed off by scissors from the upper or lower skin border of the wound in the lid, but I prefer taking them from the skin behind the ear, where the skin is of a firmer texture and where the presence of the smooth bone

surface to which the skin is attached is of great assistance in the accurate cutting of a long and slender strip; for as this strip is to be but from $1\frac{1}{2}$ to 2 mm. in width, it is very essential that the skin does not drag before the knife or scissors (as the loose lid skin is apt to do) because this would make the width of the graft so uneven as to render it unfit for use. I first make a longitudinal incision about 1 mm. deep and as long as the graft is to be. Then a second incision is made parallel to the first one and at a distance of $1\frac{1}{2}$ or 2 mm. according to the width of the intermarginal groove the graft is intended to fill. This second incision is made to join the first one at both ends and to meet it at a depth of 1 mm. by giving it a slanting direction. The narrow wedge-shaped strip of skin thus mapped out is seized by a fine forceps, completely dissected off and transferred directly to the wound in the lid border which previously has been carefully freed from all blood coagula. The graft is spread out and gently pressed into the groove, and if it fits nicely the lid is once more irrigated with the salt solution. Both eyes then are covered with compresses and bandage in order to stop all movements of the lids. After twenty-four hours the graft is so firmly adherent that the bandage may be left off. Should the graft be too long or too wide the ends or edges can be trimmed down with scissors without taking the graft off from its new resting place. But if it is too thick and stands out beyond the plane of the wound edges I turn it over with its epidermis surface down, shave off a little of the cutis with fine scissors and put it back in place again.

During the first two weeks the epidermis of the graft is repeatedly shed; it is, therefore, advisable to keep the new lid border well lubricated with vaseline or a simple ointment lest the dry and hard epidermis scales annoy and irritate the eye. After this period of desquamation the surface becomes smooth and the engrafted piece can hardly be distinguished from the rest of the lid border.

I regard these skin grafts a much better material for the reconstruction of the lid border than the grafts of the Thiersch kind or of mucous membrane, for we have to deal with a groove-like wound which has a great tendency of

closing up from the bottom and drawing its edges together. The implantation of a solid graft will resist this contraction far better than if we only line the surface of the wound with epidermis or mucous membrane.

The use of such skin grafts has been objected to on the ground that they might contain fine hairs which would prove a new source of irritation to the eye. Judging by my own experience I must pronounce this fear groundless. I have never seen any hairs grow in these grafts and I am inclined to the belief that when any hairs are found, a careful examination will show that they do not come out of the graft, but from the posterior edge of the lid border; in other words they are eyelashes which were left in the posterior edge when the lid border was split.

HEREDITARY RETRO-BULBAR NEURITIS.

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HEREDITARY amaurosis was known to exist in pre-ophthalmoscopic times, but owing to the absence of precise methods of diagnosis it was confounded with retinitis pigmentosa and other diseases of the fundus. Graefe,¹ in 1858, described a case of retro-bulbar neuritis, being the first recorded in which an ophthalmoscopic examination had been made. In 1865 he described other cases, but it remained for Leber,² in 1871, to give a graphic description of the disease. He there reports fifteen cases of his own, in four families, and gathers the records of the authentic cases previously reported. Other cases have been added to the literature by Fuchs,³ Norris,⁴ Keersmaecker,⁵ Habershon⁶ and others, but practically nothing has been added to description of the disease as given by Leber. Having had an opportunity to watch a case of this kind for several months I thought it of interest to report it and call attention to some of the peculiar characteristics of the disease:

Myrtle E., 14 years of age, came to the clinic of the Illinois Charitable Eye and Ear Infirmary, March 30, 1894, and gave the following history: About two months ago she began to have severe frontal headaches two or three times a week which lasted for a day or more. About a month later she noticed that the sight of her right eye was failing, and a few days after that the left began

to grow dim. Her eyes were normal in appearance and the ophthalmoscope showed only a slight congestion of the vessels in the right eye and a faint pallor of the temporal part of the optic disc in the left eye. There was also a large, deep physiological cupping of the disc which made it more marked. Her vision in the right eye was $\frac{1}{200}$, and with the left she could count fingers at 1 foot. Her fields of vision as taken at this time showed some contraction and a poor perception for colors, but no scotoma could be defined. Her general health had always been good and there was no appearance of any hereditary or constitutional disease.

Her family history revealed the fact that a sister had an eye trouble similar to hers, beginning at 12 years of age, with severe headaches and progressing blindness, which remained constant for several months and then improved to some extent. It continued in this condition until her death, caused by an accident, at 34 years of age. The history did not reveal any eye trouble of this nature in the family previous to these cases, but their knowledge of the other members of the family was very meager. The father is living and has never had any eye trouble. He has been addicted to excessive alcoholism all his life, as well as his father before him. The mother died at the age of 54 from pneumonia. She was myopic, but otherwise had no eye trouble. Three sisters died in infancy. One sister is living, healthy, and never had any eye trouble.

The patient was given strychnia, $\frac{1}{30}$ grain, three times a day for a month, when her vision was: R. E. = $\frac{1}{200}$; L. E. = $\frac{8}{200}$. The discs had become paler, especially on the temporal side. Hypodermatic injections of antipyrin (7 to 14 grains) every second day, as recommended by Valude, were then given, with no result, but a more normal coloring of the disc and a gradual failing of vision. May 4, R. E. V. = fingers at 6 feet; L. E. V. = fingers at 4 feet. The vision was very inconstant, varying with the position of the eye, as central vision was completely absent. An attempt was made to map out the scotoma, but she could not fix the eyes sufficiently to do so. On September 21, vision equalled fingers at 5 feet with each eye. There is a large positive central scotoma which can be easily defined and she has developed the faculty of eccentric fixation so she can use the eyes better than formerly.

She disappeared from the clinic and I did not see her again until she came to my clinic at the College of Physicians and Surgeons the last of November. The central scotoma had grown larger and the discs were much paler. The whole nerve now appears atrophic, but the atrophy is more marked on the temporal side. V. = fingers

at 3 feet with each eye. In January I again examined her and found the fields of vision and sight nearly the same as in November.

The characteristics of the disease are very similar to those of toxic retrobulbar neuritis at the onset. It differs from it, however, in the ultimate destruction of that part of the optic nerve supplying the central region. The disease is usually preceded by severe frontal headaches and pain back of the eyes. The destruction of central vision progresses quite rapidly, so that in a few weeks it is limited to the perception of large objects with the peripheral part of the retina.

The age at which it most frequently occurs is about that of puberty, although some cases are reported which occurred as early as 8 years and others as late as 45. In males it almost always occurs between 15 and 25 years, while in females there seems to be two periods of frequency—puberty and at the menopause. It is much less frequent in women than in men. According to De Wecker, the proportion is 8 or 10 to 100, but among the authentic cases in the literature I found 13 females to 39 males. Leber⁷ believes that when it occurs in women it takes a much more malignant course.

The transmission of the disease is rarely direct, but is usually through a healthy female to the second generation. It is easily traced in some families through several generations, while in others there is only the fact of its occurrence in several members of the same family at about the same age. The disease usually follows a similar course in all members of a family, but varies much in course and severity between different families. The occurrence of syphilis or excessive alcoholism in the parents is said by De Wecker to have no demonstrable effect in its production. This, however, seems to me to be very questionable, as we know the tendency of the children of such parents to other diseases of the nervous system. In the case reported we have no other cause apparent except the tendency to the disease transmitted by the father and grandfather, who were inebriates most of their lives.

The analogy between toxic and hereditary retro-bulbar neuritis is very great. In many cases of toxic retro-bulbar neuritis there must be a tendency to the disease or weakness

of that part predisposing it to an attack, as the amount of the toxic substance taken is not large. So we may consider the tendency so slight in these cases as to require some toxic influence to produce the disease, while in the hereditary form the tendency is so great as to require only ordinary conditions to produce it, as the changes at puberty, so that it manifests itself in several members of a family or even in several generations, as an "idiopathic" disease.

The diagnosis of the disease can only be made from a careful history of the patient's family, as it presents no distinct symptoms which may not be found in other diseases of the optic nerve. It is most likely to be mistaken for toxic retro-bulbar neuritis, as it presents a very similar appearance at an early stage. Its rapid progress, the destruction of the central fibers of the nerve and the supervening palor and atrophy of the temporal side of the disc when combined with the history of a similar trouble in other members of the family will be enough to fix the diagnosis of hereditary retro-bulbar neuritis.

The prognosis of the disease is bad as far as any hope of improvement of vision from treatment is concerned. It is favorable, however, in so far that complete blindness does not take place. The vision may not return sufficiently for any particular work, but by the development of the peripheral part of the retina it may improve to some extent. Norris records two cases where the vision, after remaining very poor for some time, increased to $\frac{6}{30}$, and enabled them to do ordinary work.

Treatment is apparently of no benefit in most cases, as the disease steadily progresses in spite of it. Despagne thinks, however, that those cases in which it is carried out thoroughly do not develop such a degree of blindness as those in which it is not used. This is, however, hard to determine, for the extent to which it progresses varies much among different families.

The points to which I would call particular attention in this disease are:

Its resemblance at its beginning to the ordinary cases of toxic amblyopia of a severe type.

The rapid destruction of vision in the central part of the retina combined with very slight changes in the optic disc.

The variableness of the vision due to the inability to use the peripheral portion of the retina.

The ineffectiveness of treatment to influence the course of the disease.

The fact that total blindness does not result, although the vision remaining may be of a low degree.

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Daguenet et Galezowski: "Variété non encore décrite d'amaurosis congenitale," *Journal d'Ophthalmologie*, 1872.

Prouff: "Sur une forme d'atrophie papillaire observée chez plusieurs membres d'une même famille," *These*, Paris, 1873.

Mooren, *Ophthal. Mittheilungen*, Berlin, 1874.

Alexander: "Drei Fälle von hereditäre Sehnervenleiden," *Zehender's klin. Monatsblätter*, 1874.

Pufahl: "Ueber hereditäre Amblyopie," *Berliner klin. Woch.*, 1876.

³ Fuchs, *Zehender's klin. Monatsblätter*, 1879.

Galezowski: "Des amblyopies et des amauroses congenitales," *Rec. d'Ophthal.*, 1879.

Higgins, *Medical Times and Gazette*, 1880, and *The Lancet*, 1881.

⁴ Norris: "On Hereditary Optic Atrophy," *Trans. of the Am. Ophthal. Soc.*, 1880-1884.

⁵ Keersmaecker: "De l'atrophie axiale du nerf optique observée chez plusieurs membres d'une même famille," *Rec. d'Ophthal.*, 1883.

Story: "On Hereditary Optic Atrophy," *Trans. of the Academy of Medicine of Ireland*, 1884.

⁶ Habershon: "Hereditary Optic Atrophy," *Trans. of the Ophthal. Soc. of the United Kingdom*, Vol. VIII., 1887.

⁷ Leber, *Graefe und Saemisch Handbuch f. Augenheilkunde*, Vol. V., 1877.

THE OBLIQUE MUSCLES AS RELATED TO OBLIQUE
ASTIGMATISM:REPLY TO DR. HOTZ'S CRITICISM.¹BY G. C. SAVAGE, M. D.,
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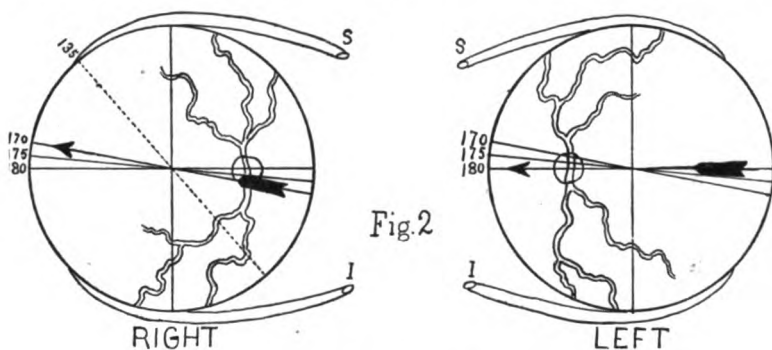
EDITOR OF ANNALS:

I plead guilty to the charge of having "talked" much and "written" more on this subject. I plead guilty, further, to the charge of having taught one thing (harmonious non-symmetric action) in 1887, and another thing (harmonious symmetric action) in 1891. To have taught an error is to no man's credit. It was my good fortune, however, to detect this error. I quickly exposed the incorrectness of my 1887 teaching—just as quickly as if another had been the unfortunate one. The main thought of my first paper was that oblique astigmatism was more annoying than the vertical or horizontal, because, in the former, the oblique muscles were involved. This was no error. I then knew nothing of the obliquity of images in oblique astigmatism; and, believing the old teaching that the oblique muscles must always keep the naturally vertical meridians parallel, I readily fell into the error of teaching that the action of the obliques, caused by oblique astigmatism, was "harmonious nonsymmetric." I at that time conceived the purpose of the rotation to be to bring the meridian of best curvature to, or as far as possible toward, the vertical or horizontal position, a work in which the obliques were often aided by a leaning of the head toward the shoulder.

¹ On the alleged action of the oblique muscles in oblique astigmatism, ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY, Vol. IV., No. 2, April, 1895.

I then thought the vertical (and horizontal) astigmatism gave least trouble because of the mere fact of position; but now I can understand why oblique astigmatism with meridians of greatest curvature parallel, will give as little trouble, for in each of these conditions any object will throw similar images on corresponding retinal parts. For the reason that the obliques do not have to perform their complicated function in these forms of astigmatism, their correction is never attended by metamorphopsia or other annoyance.

I try always to "have a reason for the faith that is within me," and any change of faith or teaching on my part must be based on reason. My reason for abandoning the teaching of harmonious non-symmetric action of the oblique muscles in oblique astigmatism, and, in its place, teaching that these muscles must act symmetrically, is that the refraction of such



eyes cause the formation of dissimilar images on non-corresponding parts of the retina. This thought of oblique images in oblique astigmatism occurred to me one night early in 1891, and the next day I was able to demonstrate its correctness, not only to my own satisfaction but also to the complete satisfaction of Dr. G. H. Price. I did not then remember that Dr. J. A. Lippincott had taught us this in the *Archives of Ophthalmology*, April, 1889.

Dr. Hotz complains that I have not given my "method of observation," and that I failed to set forth "the tests or experiments" that led me to my conclusions, so that others might judge for themselves as to the correctness of same. This accusation was certainly inadvertent, for a little further

on (page 105 of your last issue) he quotes my experiment in part. I give it here in full: "The obliquity of the images in oblique astigmatism is a matter demonstrable. One can artificially produce any kind of astigmatism. One who is emmetropic, or at least is non-astigmatic, by placing a — 3 D. cyl. before each eye in trial frames, creates 3 diopters of hypermetropic astigmatism. The axis of the left cylinder being at 90° and that of the right at 135° , he has made of his own eyes the kind represented by Fig. 2. He may now for a moment place the opaque disc in front of his right eye, at the same time placing the double prism (each 6°) before the left eye. A horizontal arrow, head to left, having been drawn on a card board, he looks through his double prism and sees two horizontal, hence parallel arrows. On removing the opaque disc from the right side of the trial frame a third arrow appears between the other two, but not parallel with them—it



FIG. 8.

is oblique down and to the patient's left. On removing the double prism two arrows are at once readily seen, the one crossing the other, as in Fig. 8. In a moment the two arrows begin to shut and open like the blades of a pair of scissors, and finally they are merged indefinitely into one."

I commenced the experiment, convinced that artificial astigmatism would produce the same image-changes which result from natural astigmatism, and what convinced me was that my 3 D. artificial hyperopic astigmatism was thoroughly corrected by a + 3. D. cyl., axis coinciding with the meridian of unaltered curvature. The above experiment seems to me to be convincing. I have other reasons for believing in the obliquity of images and will give some of them in words I recently used in THE JOURNAL. "Let Dr. Hotz take any case of astigmatism of more than 3 D. with the meridian of greatest curvature either vertical, horizontal or oblique, and, if the patient has ordinary intelligence, he can soon satisfy himself that astigmatism is not only capable of blurring, but also of distorting an object. One eye should be excluded while the

patient is asked to look at a rectangular card, two by four inches, held vertically immediately in front of the patient, at the reading distance. As the card is revolved on a pin piercing its center the patient should be asked its shape when at three definite points. When the long sides of the card are parallel with the meridian of greatest curvature, the patient will say it is a rectangle; when these sides form an angle of 45° with the meridian of greatest curvature, the answer will come quickly that it is a parallelogram; again, when these sides are brought to right angles with the meridian of greatest curvature, the card again is seen as a rectangle. But possibly Dr. Hotz is ready to say that these statements as to the distortion of the object prove nothing as to the distortion of the retinal image. Let us see: The law of projection (direction) is supreme in monocular vision, therefore, the lower border of the retinal image must be in the same plane with the upper border of the card, and so on for all the borders of the card and image, and these planes must all cut the nodal point. Then in obedience to this law the image must be distorted when the object appears to be.

“Only one other argument as to the distortion of the retinal image in an astigmatic eye, when the object is held so that its outlines are oblique to the principal meridians: all will agree that the meridian of least curvature is the line of union of the bases of the prismatic arrangement of the astigmatic cornea, and that all prisms refract light towards the base. Let us then take the right eye of a case of astigmatism with the meridian of least curvature at 135° ; a horizontal line held before this eye will send its light from its entire length into the eye, but for convenience of study we will consider only the axial rays coming from the two extremities. The ray from the left end of the line strikes above the meridian of least curvature and must be bent towards it, its subsequent course in the eye necessarily being down and out; the axial ray from the right end of the line strikes below the meridian of least curvature and must be bent towards it, the course of this ray after refraction being up and in. Thus it is easily shown that the image of this horizontal line must be inclined down and to the right. Because of this inclination of the

image, the line itself seems inclined to the same extent and in the same direction. This is one law of physiologic optics.

“The distortion of retinal images in monocular vision is settled by the law of direction; the rotation of the eyes by the oblique muscles, in oblique astigmatism, is compelled by the more powerful law of corresponding retinal points.”

Dr. Hotz made the following quotation from one of my papers: “In oblique astigmatism, be the obliquity much or little, it is a physical impossibility for the horizontal object and the retinal image to occupy the same plane. The same is true of all objects not in a plane with one or the other of the two principal meridians.” Forgetting that the closing sentence of the above quotation had been made, the doctor informs me and your other readers that “the objects in nature are not all horizontal arrows, but present also vertical and oblique outlines,” “unfortunately for Dr. Savage’s theory.” The fact that when oblique astigmatic eyes attempt to fuse images of a horizontal line, the images of a vertical line harmonize less, which Dr. Hotz thinks unfortunate for my theory, is favorable to my teaching. In an editorial in the *Ophthalmic Record*, referring to Dr. Wilson’s criticism published in the *Archives of Ophthalmology*, I conceded that the same eyes could fuse images of either horizontal or vertical lines when they existed alone; for example, the meridians of greatest curvature diverging above, the superior obliques would cause the fusion of the images of a horizontal line, and the inferior obliques would fuse the images of a vertical line. In the same editorial I taught when both horizontal and vertical lines are viewed that the eyes attempt the fusion of the horizontal lines only; but was unable then, and am unable now, to give any reason for this. I only know it to be a fact. My knowledge of the fact rests on these observations which may be repeated by anyone: In a case of 3 D. astigmatism, with meridian of greatest curvature at 135° for right eye and 45° for left eye, if a rectangle be looked at by the right eye alone it will be seen as a parallelogram, leaning down and to the left; by the left eye alone, a parallelogram, leaning down and to the right; with the two eyes together it will be seen as a trapezoid with the longer side above. By action of the

superior obliques the upper borders of images (lower border of object) are completely fused, while at the same moment all of the lower border of right image, except its inner extremity, is fused with a corresponding portion of the same border of the left image. The parts of the lower borders of the two images not fused are directly continuous with the fused portion, hence the greater length of the upper border of the object. Of the two diverging borders, the right one is seen by the right eye, and the left one by the left eye.

If the meridians of greatest curvature had converged above the action of the inferior obliques, in binocular vision, would have converted the rectangle into a trapezoid with the longer side below. As already stated, this preference for fusing horizontal lines is distinctly shown in the higher degrees (3 D. or more) of natural oblique astigmatism. It is also distinctly shown in similar degrees of artificial astigmatism. The chief purpose of the existence of the recti and the *oblique* muscles is the fusion of images in binocular vision.

As to Dr. Hotz's experiment with his $+10 \text{ C} + 2 \text{ cyl}$. I have this to say: His slit in the metal screen was entirely too short ("one inch") to be so far removed ("several feet") from the surface representing the cornea. Necessarily this slit, at such a distance, would throw a very short image on the ground glass four inches behind the lens, and thus make it very difficult to detect the slight leaning (less than 2°) of the borders, caused by the weak cylinder used. A slit several inches long and only a few feet away from the lens would have thrown a much longer image on the ground glass, so that the very slight change in direction of the image borders could have been easily detected. Dr. Hotz's report of this experiment is as strange as fiction though given as a fact: when the slit occupied the horizontal position, the cylinder, when revolved, inclined the vertical lines without altering the direction of the horizontal lines; when the slit was turned to the vertical position, the same cylinder, when revolved, inclined the horizontal lines without changing the direction of the vertical lines. A lifeless lens cannot show any partiality to rays of light coming from horizontal or vertical lines that bear the same relationship to the cylinder axis.

Now allow me to try to break in pieces the "key-stone" of his argumental arch, viz: the clinical test to which he put my theory. The case reported was one of mixed astigmatism, and the cylinder given the right eye probably was a — 3 D., and that for the left eye a — 2 D. The meridian of greatest curvature in O. D. was 115° ; in O. S. at 65° . (These meridians diverged above. The image of a rectangle would have been distorted down and in by each eye, and in binocular vision these leaning parallelogram images would have fused so that the patient would have seen a trapezoid long side above.) The correcting cylinders were given and metamorphopsia was observed at once by the patient, but he does not give the character of the changed vision. Without the correcting lenses on he resorted to a test, the double prism, which he states I had advised, and he found all three lines parallel.

My first strike at this "key-stone" will be with the statement that I have never resorted to this test by the double prisms in uncorrected natural oblique astigmatism, nor have I ever advised it. I would expect the lines to be parallel, for the obliques, from habit, would so rotate the two eyes as to make the lines parallel. If he had used the double prism test on his patient while wearing her spectacles, and still troubled with the metamorphopsia, he would have found want of parallelism of the middle line with the two other lines; it would have inclined down and toward the corresponding side. The same test applied after the disappearance of the metamorphopsia, the spectacles being on, would show parallelism of the lines; but removing the lenses at this time the test would show the middle line leaning down toward the opposite side. The explanation of all this is easy:

The double prism test in oblique artificial astigmatism (this I did advise) will always show the dipping of the middle line, because the habit of rotation by the obliques has not been established. In Dr. Hotz's case of mixed oblique astigmatism the superior obliques had been always in the habit of rotating the eyes, and this habit reasserted itself when the eyes were under the double prism test, as may always be expected, and the lines were parallel. If the metamorphopsia has disappeared under the wearing of the lenses, the double prism test

applied to the naked eyes will show the middle line dipping down and toward the opposite side, for the habit of rotation has been broken. There never was (there never will be) a time in this case when, with the naked eyes, there was not metamorphopsia of that kind which would have made a rectangle appear as a trapezoid, the longer side above. To this form of metamorphopsia the patient had always been accustomed, and therefore was not worried about it. The form of metamorphopsia with the lenses, when they were first given, was a new kind—the trapezoid had its long side below, necessarily, though the doctor did not tell us so much. Being new to the patient, it was naturally annoying. An explanation of this new metamorphopsia is easy: while carrying the patient through the examination for the lenses, he, of course, excluded one eye. The uncovered eye naturally rolled into the position of rest for all the ocular muscles, and the axis of the cylinder for that eye was located. Similarly the cylinder was given the other eye. In binocular vision the old habit of rotation by the superior obliques was reasserted, and there was a consequent loss of coincidence of the axes of the cylinders and the meridians of least curvature (the cylinders were concave), the cylinder axes being thrown (about 3°) in the arcs of distortion for the inferior obliques. In this case the metamorphopsia could disappear only by the superior obliques giving up work which the inferior must take on. Without the lenses the superior obliques have been forced to converge the naturally vertical meridians; with the lenses on the inferior obliques must parallel these meridians. Usually this change is quickly accomplished in cases like this one. Dr. Hotz will not deny that the cylinders given changed the direction of the images of vertical and horizontal lines. To my mind it is clear that the leaning of images caused by the lenses was equal in extent, but opposite in direction, to that produced by the astigmatic cornea. The lenses have only rectangled the images of the rectangular figure. If in these cases the oblique muscles would only allow the cylinder axes and the meridians of best curvature to remain coincident in binocular vision, there would be no such thing as metamorphopsia ever complained of. It is never observed by patients

having astigmatism equal in the two eyes and the best meridians parallel, though they may be oblique. When the meridians of greatest curvature converge above, the use of correcting cylinders is always attended by metamorphopsia which is slower to disappear than in cases like Dr. Hotz's.

Dr. Hotz's closing paragraph, if true, would wipe out all that I have ever written about oblique astigmatism and the oblique muscles. This is his language: "It is, therefore, evident that neither experiments nor clinical observations nor the laws of physiological optics sustain the doctrine of the obliquity of the retinal images and the necessity of any action of the oblique muscles in oblique astigmatism."

In another part of this reply I have shown conclusively that both experiment and clinical observation prove my teaching to be correct, so that two of his three witnesses against my views have been made to testify in favor of them. It is even easier to capture his third witness (physiologic optics) and thus make the trio give evidence the very opposite to that which he intended they should give. Without doing violence to the laws of physiologic optics, I may state that every point of an astigmatic cornea has two radii of curvature, one the radius of spherical curvature, the other the radius of cylindrical curvature.* In the horizontal meridian of a vertical astigmatism, these two sets of radii are in the same plane, hence the rays of light entering the eye in the horizontal meridian, would be in the same plane after the refraction as before. Above or below the horizontal meridian, and out or in from the vertical meridian, there is not a corneal point that would give us these two radii in the same plane; the radius of spherical curvature would go to the center of the sphere while the radius of the cylindrical curvature would necessarily be in a horizontal plane. Both of these radii will be directed toward the plane of the vertical meridian, but they diverge as they go. A ray of light striking such a point must undergo a double refraction (a resultant refraction). If the corneal point is thus related to the horizontal and vertical meridians, the ray of light passing through it must be deflected

* There is only one radius, the resultant of the two. It is the radius, not of a spherical or cylindrical surface, but of a sphero-toric surface.

towards each of the two radii, therefore the refracted ray can no longer occupy any plane in common with the incident ray.

Allowing the retina to remain in its normal position, let us revolve the astigmatic cornea discussed above so that the astigmatism shall be oblique, at an angle of 45° . In doing this we have not altered the relationship of the two sets of radii—those that were in the same plane before, are so now; those that diverged before, diverge still. Let us conceive it to be the right cornea and that the meridian of least curvature now stands at 45° . The meridian that was at 45° when the astigmatism was vertical, stands at 180° when the astigmatism is oblique at 45° . What happens now to the axial rays in the horizontal plane? We will take three of these rays and follow them as they make their way back to the retina: one ray is from the middle of a horizontal line (arrow, if you please), one is from one end of the line and the other is from the other end. These rays must converge toward that part of the cornea in front of the pupillary space. They come to the eye in the same plane and strike the horizontal meridian of the cornea. The point of fixation is the center of the line, therefore the middle of these three rays strikes the center of the cornea vertically, and therefore coincides with both the radius of spherical and radius of cylindrical curvature for that point, hence passes through the cornea without being refracted at all and *impinges on the retina's horizontal meridian*. The ray from the right end of the line strikes the right side of the cornea at a point in the horizontal meridian, the two radii of which diverge, the radius of spherical curvature being in the horizontal plane, the radius of the cylindrical curvature pointing down as well as towards the plane of the meridian of least curvature. It is clear that this ray must undergo a double (resultant) refraction. Striking the cornea to the temporal side of radius of spherical curvature, it is so refracted as to converge less towards the middle axial ray (in this it is aided by the cylindrical curvature), and being incident to the radius of the cylindrical curvature on its lower side, it must be refracted down also. Following its subsequent course we find *it impinging on the retina below the horizontal meridian, to the nasal side of the vertical meridian*. The ray from the left

end of the line, coming to the cornea in a plane with the other two, strikes the cornea on the nasal side of its center and in the horizontal meridian, at a point from which the two radii diverge, the radius of spherical curvature being in the horizontal plane, the radius of cylindrical curvature pointing up and toward the plane of the meridian of least curvature. Striking the cornea on the nasal side of the radius of the sphere, this ray is made to converge less toward the middle ray than before refraction; striking the cornea on the upper side of the radius of cylindrical curvature, it is also refracted upwards. Following this ray to the retina we find *it impinging above the horizontal, and on the temporal side of the vertical, meridian.* A line drawn through these *three points of impingement* will locate the *image* of the line (arrow) looked at. It is inclined in obedience to the law of refraction that a ray of light in passing from a rarer into a denser medium must be refracted toward the perpendicular at the point of impingement.

There is one other objection which Dr. Hotz brought forward, viz: While a concave cylinder held obliquely in front of an eye at some distance will make horizontal and vertical lines appear inclined towards its axis, this inclination grows less and less as the eye is approached, and, as he thinks, disappears entirely when the cylinder is brought into contact with the cornea. This is all easily explained. Take again the three axial rays in a horizontal plane. Striking the horizontal portion of the oblique cylinder, the middle ray passes through unrefracted and continues in the same plane, while one of the outer rays is made to deviate downwards, and the other upwards. For convenience of study we will say that the deviation of each ray is 2° from the horizontal plane. This deviation continues the same until the retina is reached, regardless of whether this distance is 1 m. or 25 mm. In obedience to the law of direction the horizontal line is made to appear to incline more when the cylinder is held 1 m. from the eye than when it is held 50 cm. away. In obedience to the same law the line appears less and less inclined as the oblique cylinder is made to approach still nearer the eye, but even when brought into contact with the spherical cornea, its inclination does not and cannot disappear entirely, though often one

may not be able to perceive that there is still an inclination. This apparent change in the direction of a line viewed through a concave cylinder held obliquely, as it is moved from arm's length to the eye, could not be explained if Helmholtz' law of direction were true. If the axial ray were the line of direction, the apparent obliquity of a horizontal line would be the same whether the cylinder causing the phenomenon were held at arm's length or in contact with the eye, for the reason that, after the axial rays are deflected, some above and some below the horizontal plane, they pursue a straight course to the retina whether it be far away or near by. These rays prolonged, according to Helmholtz, would locate the source of the light, and necessarily would give it the same apparent inclination for all distances at which the cylindrical surface might be held from the eye. Not so with that law of direction which says that all lines of direction are radii of retinal curvature prolonged. This law makes it necessary for the line to appear to incline more when the cylinder is held far away from, and less when it is brought close to, the eye.

NOTES OF A CASE OF GLIOMA OF THE RETINA.

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JANE A., 4 years of age, the fifth child of a healthy family of six children. Father and mother healthy; no history of miscarriages. Two years ago she would occasionally awaken in great fright screaming and apparently would not know or be pacified by her parents. Had convulsions. With this exception her health was good. Six months ago a grayish yellow appearance was first noticed behind the pupil in the left eye.

On April 7, 1894. she was kindly referred to me by Dr. McKay, of Manotick, when the appearances in the eye were as follows: That which first attracted attention was a yellowish gray mass shining behind the dilated pupil, which could be easily seen with the unaided eye. It had a consistent look, and smooth, uneven surface, upon which there were no vessels. It half filled the vitreous chamber and appeared to proceed from the nasal side. The anterior chamber was shallow from pressure from behind; the iris was of the same color as the other; the pupil was dilated, but regular, reflex absent. The ciliary border was darkly congested by enlarged blood vessels, chiefly veins. Other blood vessels at the inner and outer canthus more superficial ran horizontally, the cornea and lens were clear. Tension + 2. Vision *nil*. Lids slightly edematous; no proptosis; no increase of corneal curvature; movement of globe normal; right eye normal. Immediate enucleation was advised.

She was again brought to me on April 16, nine days after the first visit. The ciliary border was more prominent and more vascular, while the corneal curvature was increased and cornea steamy, with loss of luster. Tension about the same as before: + 2. Had occasionally cried, complaining of her head, the past two days.

April 18. Enucleation under chloroform; globe filled orbit so that it was with difficulty prized out intact. Nerve divided well back, looks healthy. A dark granular suspicious looking substance was removed from the upper part of orbit. Patient made a good recovery from the operation and remained in fair health up to July, three months after operation, when she began to fail. The orbit became full and the lids distended by a growth behind them, which gradually became more and more projecting until it protruded $2\frac{1}{4}$ inches in a cylindrical form with a tuberosus summit, granular, and oozing an ichorous pus and blood (fungus hematomas). The skin about the orbit was made to bulge forwards, the veins in which were greatly enlarged. She slowly declined during the remaining months of the year, being convulsed several times, until December 24, when she died—fourteen months after the discovery of the disease and eight months after operation. The right eye remained unaffected.

REMARKS.

I have thought the foregoing case sufficiently important for publication, not only as glioma is an uncommon disease and the only neoplasm which occurs in the retina, but on account of symptoms which would tend to confound it with pseudoglioma, which would materially modify the prognosis. Glioma is a growth from the neuroglia, and has its origin only in nerves or the nerve centers. It consists microscopically of small round cells, sometimes with spindle cells within a delicate stroma, securing very large neuclei. It is a disease almost exclusively of children, sometimes noticed at birth and frequently a few weeks or months afterwards. Though a rare disease, Messrs. Lawford & Collins (*Royal Lond. Hosp. Ophth. Reports*, 1890) publish sixty cases, fifty-five of which were cases in Royal Hospital during the years from 1871 to 1890, in connection with which many instructive points have been brought out. According to these observers, during the first two years of life is the period in which it oftenest shows itself. The disease may be bilateral, affecting both eyes simultaneously or within a short interval. The right and left eyes are about equally affected as also are the sexes.

Recoveries after enucleation are rare, even where the limit of three years is regarded as being such, the percentage being as low as 12% to 15%. Recurrence is the rule in a great majority, which terminate fatally in a few months. From the literature of the subject recoveries seem to bear little relation to the age of the patient, nor, strange to think, by the length of time between detection and removal. For example, in a case of undoubted glioma there was no return after nineteen years, disease was detected at 2 years of age and was not operated on till one and one-half years later.

Diagnosis in advanced cases may be made with tolerable certainty, but in their beginning, if then detected, diagnosis is uncertain and difficult. The microscope alone can decide its real character. That often while it is most difficult to differentiate, it is pseudoglioma, which does not mean any particular and definite pathological condition, but any resembling glioma which might be mistaken for it. The difficulty of diagnosis may be more readily estimated when it is known that of twenty-four eyes removed for supposed glioma retinae at the Royal London Ophthalmic Hospital (Moorfields), whereon a consensus of opinion of wide experience was brought to bear, notwithstanding which, seven subsequently by microscopic examination showed a mistaken diagnosis. Other conditions likely to be confounded with glioma are persistent fetal conditions, notably persistency and potency of the hyaloid artery, causing excessive and maldevelopment of the lens capsule. Also concretions of tubercle in the choroid. Detachments of the retina from other growths, or the products of ophthalmitis.

In the above reported case the cerebral symptoms preceding the disease in the eye, viz., the startling cry out of sleep and convulsions, which were indicative of meningitis, rather pointed to pseudoglioma than true glioma, the latter of which a microscopic examination proved it to be.

There was not at any time middle-ear disease or a purulent discharge from the ears.

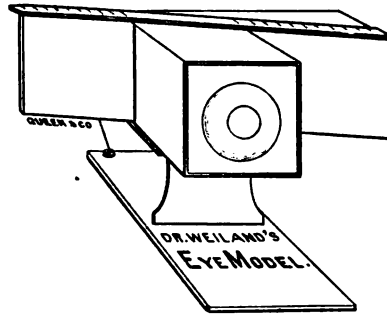
A NEW ARTIFICIAL EYE, MADE ENTIRELY OF
GLASS AND GIVING IMAGES OF EXACTLY
THE SAME SIZE AS THE SCHEMATIC
EYE OF HELMHOLTZ.

By CARL WEILAND, M. D.

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HOSPITAL, PHILADELPHIA.

IT is the purpose of the following lines to describe an artificial eye, the refractive part of which consists entirely of glass, and which is so constructed that the images formed by it are of exactly the same size as they are in the emmetropic human eye, or more correctly expressed, as they are in the latest schematic eye of Helmholtz. As the size of the retinal image depends upon the distance of the second nodal point of the eye from the retina, which in the latest eye of Helmholtz equals 15.49 mm., the new eye must be so constructed that its second nodal point is likewise 15.49 mm. from the retina. As, furthermore, only *one* refractive surface is necessary in imitation of the reduced eye of Listing and Donders, and as one refractive medium allows the nearest approach to the human eye, we have taken only *one* refractive medium, glass, which enables us to find the radius of curvature that has to be given to the refractive surface in order to comply with our demands. For it is known from the theory of refraction that in one refractive medium the two nodal points are reduced to one and coincide with the center of curvature of the anterior surface of the refractive medium. It is further known that the distance of this nodal point from the second principal plane or retina is equal to the anterior focal distance F_1 of this reduced eye, which gives the equation $F_1 = \frac{r}{n-1}$, where r is the radius of curvature of the refractive surface and n is the refractive index of glass (in our case = 1.53). As F_1 is to be equal to 15.49 mm., we have $15.49 = \frac{r}{1.53-1}$, which makes $r = 8.20$. All we have to do, therefore, is to grind a small plano-convex lens of a radius of 8.20 mm.

and to cement this with Canada balsam (of the same refractive index as glass) to a block of the same glass as the accompanying illustration shows. The length of the block of glass must be such that its posterior surface coincides with the posterior focal plane of the eye, which means that the distance from anterior surface of cornea to retina must be $r + \frac{r}{n-1} = 8.20 + 15.49 = 23.69 \text{ mm.}$ The posterior focal distance of this new reduced eye is therefore 23.69 mm. But as it is almost impossible for the manufacturer to exactly obtain this distance of 23.69 mm. , and as it is further desirable that the eye should be made longer or shorter to represent the axial changes of the human eye, a prism of glass (of 10° angular aperture) is brought in contact with the posterior surface of the eye, the plane of which has been ground off obliquely, so



that it makes an angle of 80° with the optical axis of the eye. For the addition of the prism again produces a surface, which is always at right angles to the optical axis; while by pushing the prism along the posterior surface of the glass block the eye can be made longer or shorter without the introduction of air.

A scale has been added, which exactly indicates the refractive condition of the artificial eye. This scale is calculated with this supposition, that the refraction is reckoned in the same way as in our own eye, namely, from the anterior focal point of this eye, which lies 15.49 mm. in front of its cornea. Now the scale can be easily calculated just as in the human eye; for in such a system of an eye with axial emmetropia and correcting lens at its anterior focal point the absolute values of the anterior and posterior focal distance remain the same as in the emmetropic eye, and so, also, does the distance of second nodal point from retina or second principal focus, but this nodal point is displaced to the same extent as the second principal plane, namely, by $-\frac{F_1 F_2}{f} \text{ mm.}$, where F_1 and F_2 refer to the anterior and posterior focal distances of the eye, and f indicates the focal length of the lens, used at the

anterior focal point of the eye to correct the axial ametropia. In our new eye we have $F_1 = 15.49 \text{ mm.}$ and $F_2 = 23.69 \text{ mm.}$, and if we now take f as equal to 1000 mm. , i. e., if we take a lens of 1 dioptre, we find that the axial lengthening of our new eye, to be corrected by a glass of 1 D., must be $-\frac{15.49 \times 23.69}{1000} \text{ mm.} = -0.367 \text{ mm.}$ If, therefore, we displace the retina of this eye in the direction of the optical axis by 0.367 mm. we obtain a difference of refraction equal to 1 dioptre. This is almost exactly the same as in the human eye, or rather in the average eye of Helmholtz, where a displacement of the retina equal to 0.321 mm. gives a difference in refraction equal to 1 D. But as in the new eye the prism is moved obliquely it takes more than 0.367 mm. in the direction of its movement to get 0.367 mm. in the direction of the optical axis. A little calculation shows that the prism must be moved by $\frac{0.367}{\sin 10^\circ} = 2.1 \text{ mm.}$ for each dioptre. The posterior surface of the prism consists of ground glass, so that we may observe the retinal images of objects which are now of the same size as in the human eye.

By making the eye ametropic we may observe the images of ametropic eyes, which will appear in diffusion circles of about the same size as in the human eye. The diameter, d , of the diffusion circle in the new eye for axial ametropia equals: $d = p \frac{F_1 F_2 D}{1000 (F_2 - m)}$ where p is the diameter of the artificial pupil, F_1 and F_2 the anterior and posterior focal distances of the new eye, m the distance of pupil from cornea and D the refractive value of the glass which would correct the ametropia. The diameter (d_1) of the diffusion circles of the schematic human eye according to Nagel¹ is $d_1 = p \frac{F_1 D}{1000}$, where F_1 is the anterior focal distance of the human eye and p and D have the meaning before given. Now as the ratio of $\frac{d}{d_1} = \frac{F_2}{F_2 - m}$ as F_1 of our artificial eye $= F_1$ of the human eye, by construction, we see that the diffusion circles are slightly larger in the new model, but not very much. For example an axial myopia of 1 dioptre gives in the schematic eye a diffusion circle of 0.06 mm. , while that of the new eye is 0.07 mm.

The ametropia may be corrected by a lens in front of the stop, which indicates the anterior focal plane of the model. There is besides a spring at the back, which allows any picture of the fundus to be brought in contact with the prism, where it can be viewed with the ophthalmoscope at the stop. In this manner the eye may be employed for *ophthalmoscopy*, *skiascopy* and *eidoscopy*, if I may be allowed to coin a new term for the act of observing

¹ *Die Anomalien der Refraction*, Graefe and Saemisch, *Capitel X.*, p. 467.

the images produced by this eye. The scale will be very useful to check the observer. This eye may also be employed to obtain a correct idea about the size of a scotoma in a patient's eye; for all that is necessary is to bring the new eye at the place of the patient's eye, when the image of the boundary of the scotoma, which must have been marked off in a black wall before, will appear of almost the same size as it is in the patient.

Let us now compare the new eye with that of Helmholtz:

The Schematic eye of Helmholtz has:	New Reduced Eye of Glass has:	Difference.
Cornea = 7.8 mm.	Cornea = 8.2 mm.	+ 0.4 mm.
Anterior focal distance = 15.5 mm.	Anterior focal distance = 15.5 mm.	0 0 mm.
Distance of anterior focal point from cornea = 13.7 mm.	Distance of anterior focal point from cornea = 15.5 mm.	+ 1.8 mm.
Distance of posterior focal point from cornea = 22.8 mm.	Distance of posterior focal point from cornea = 23.7 mm.	+ 0.9 mm.
Distance of second nodal point from retina = 15.5 mm.	Distance of nodal point from retina = 15.5 mm.	0.0 mm.
Axial lengthening or shortening required to produce an ametropia of 1 dioptre as measured by a glass at anterior focal point of eye = 0.821 mm.	Axial lengthening or shortening required for the new eye under the same conditions = 0.867 mm.	+ 0.046 mm.
Length of eyeball from anterior surface of cornea to posterior surface of sclera = 22.8 + 0.9 mm. = 23.7 mm.	Length of eyeball from anterior to posterior surface = 23.7 mm.	0.0 mm.

From the table it will be observed that this new eye in more than one respect differs very little from the schematic eye of Helmholtz, but that as far as the size of the retinal image is concerned it is exactly like it. In short it is a *reduced eye* in glass. The advantages which this eye offers over other artificial eyes are the following:

1. It gives images of the same size as the average human eye.
2. It may be used for ophthalmoscopy, skiascopy or eidoscopy.
3. It gives a good idea about the small change in the length of an eyeball that is necessary to produce axial ametropia.*

* This artificial glass eye may be obtained from Messrs. Queen & Co., of Philadelphia, who have taken great pains in making it as accurate as possible.

SARCOMA OF CHOROID.

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L. R. C. P., EDIN.
OF OTTAWA, CANADA.

SURGEON TO THE EYE AND EAR DEPARTMENT OF THE COUNTY OF CARLETON
GENERAL HOSPITAL, OTTAWA.

H. W., a well-grown, healthy looking lad, 16 years of age, having a good family history and no noteworthy personal history, consulted Dr. James Grant, in February last, on account of a smooth pultaceous tumor about the size and shape of the lateral half of a hen's egg, situated on the radial border of his right forearm, just above the wrist joint, which was opened and found to contain pus; there was also swelling and redness of the index, middle and ring fingers of his right hand at the roots of the nails, causing them to be clubbed, and which afterwards suppurated. In the front part of his left eye something abnormal was seen, which had been discovered by his friends some three weeks before, and on which account Dr. Grant kindly referred him to me.

On February 13, when I first saw him, a yellowish, well-defined body, 3 *mm.* square, having a smooth surface, was clearly seen in the front part of the left eye, which, at first sight, resembled an abscess in the cornea, but on closer examination with a lens was found to be a new growth in the anterior chamber, situated in the angle between the cornea and iris, extending horizontally inwards from the root of the iris on the temporal side, halfway across it towards the pupil, in a slightly radiating manner. Minute blood vessels running horizontally could be seen in its semi-translucent substance. The periphery of the iris was slightly dragged upon giving the impression that the growth came from behind it. The

pupil was slightly larger than its fellow and sluggish to light; the ciliary zone was congested. R. V. = $\frac{3}{8}$; L. V. = $\frac{3}{8}$. Tension slightly increased. Ophthalmoscope—Fundus reflex indistinct by direct method only; large vessels were obscurely seen in the fundus, for a short distance, then lost in darkness.

February 15. Two days later vision had so far diminished that he could barely read $\frac{4}{8}$. Tension as before. A disc of homatropin and cocain only slightly dilated the pupil. His eye caused him no pain, and only slight inconvenience, though vision was so greatly impaired.

The diagnosis, "sarcoma," found at his first visit, was further strengthened at his second, and immediate excision of the eye advised. He was recommended to get another opinion before the operation, which he did, and which coincided with my own. The eye, however, was not excised until a month later, when a microscopic examination confirmed the diagnosis of sarcoma. The patient made a fair recovery from the operation, but after a couple of weeks rapidly lost flesh, became cachectic, complained of dizziness, and a few days before his death, which occurred on May 5, he had several attacks of right-sided spastic convulsions. No post-mortem was obtained. Probably the cause of death was extension backwards by continuity from the choroid to the pia mater and involvement of other organs by metastasis. The temperature was not much disturbed and showed no great fluctuation. The other (right) eye was not affected.

The case is instructive in several particulars. Sarcoma of the choroid being a disease of retrograding adult life, occurring most frequently beyond the age of 50, the youthfulness of the patient makes it a rare exception.

Sarcoma of the choroid being a disease of adult life, contrasts strongly with glioma retinae, another intra-ocular malignant growth, occurs almost exclusively in early childhood. That it was without pigment, which is exceedingly uncommon in growths in this highly pigmentous covering. That it was so rapidly fatal—its duration being measured by months rather than years—two years being the average length of life in fatal cases. Prognosis is not nearly so unfavorable as in glioma retinae, where recovery is rare. In sarcoma the mortality, according to several high authorities, is about 50%, 32% being from metastasis to distant organs. That it was idiopathic; no injury or previous disease in the eye, as is often the case. That it was unattended by pain.

A CASE ILLUSTRATING THE RELATION BETWEEN
THE MUSCULAR BALANCE OF THE EYES AND
THEIR REFRACTIVE CONDITION.

By C. E. NORTON, M. D.,
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OPHTHALMIC SURGEON TO THE CENTRAL MAINE GENERAL HOSPITAL.

MISS E. P., a student in Normal School, 20 years of age, consulted me August 23, 1893, in regard to her eyes. She was in good general health. She had a noticeable convergent strabismus in the right eye. Vision in right eye = $\frac{2}{8}$, in the left eye = $\frac{3}{8}$.

She had been wearing for several months a pair of — 1.25 D. spherical spectacles which she had obtained from a prescribing optician. The use of these spectacles caused the strabismus to disappear, but it returned almost immediately on removing them. She did not wish to have an operation performed, but she wished me to prescribe for asthenopia from which she suffered severely when studying.

I found that she had hyperopic astigmatism which could be corrected by + 0.25 D. cylinder axis 90° , both eyes. I prescribed these lenses for constant use. With them her vision was $\frac{2}{8}$ in each eye. With the aid of these spectacles she was able to finish her course of study, and she graduated from the school in the spring of 1894. Since graduation she has been teaching in a city school. She called at my office March 23, 1895, and stated that if she wears the glasses constantly she has no return of the strabismus, and is able to do her work without discomfort in her eyes. Going without the glasses causes the strabismus to return after a time.

The above case has several points of interest. It will be noticed that the vision was good in both eyes, and that in the squinting eye it was but very little less than in the other eye. There was no marked amblyopia to account for the strabismus, and we have every reason to believe that in this case the sole cause of the strabismus was the optical error, acting on an overworked eye; the natural relation between convergence and accommodation producing the result. When this relation was disturbed, by the use of concave glasses, increased convergence ceased to give the same assistance to the power of accommodation, which it did before, and the convergence disappeared.

The case is interesting on account of its rarity. Cases are sometimes seen where strabismus exists, accompanied with, and probably caused by optical error in which the strabismus entirely disappears, from no other treatment than the use of properly fitting spectacles.

I have never seen a case before, nor do I remember of reading of one, where a strabismus caused by hyperopic astigmatism, was made to disappear by the use of concave spherical lenses.

The case is also of interest by being a positive contribution for the solution of the question which has been under discussion for the last few years: "Are weak lenses of any value?" It is evident that in this case weak lenses were of great value, as they relieved the asthenopia, and, what is of more importance, the strabismus, without any operation being performed.

THE QUARTER DIOPTRY CYLINDER—SOME TESTIMONY FOR.

By E. E. HAMILTON, M. D.,
OF WICHITA, KAN.

THAT the complexity of symptoms known under the general term "asthenopia" has its cause, in a large majority of cases, in ciliary muscle strain, all agree. No fact in ophthalmology is more firmly established.

Errors of refraction, both axial and those due to irregularities of corneal or lenticular curvature, (unequal refraction in different meridians of the eye) impose additional work on the ciliary muscle. Under such conditions, in many instances, the overtaxed muscle gives way under its almost constant tension and causes distressing symptoms located in and around the eyes.

Perfect health may, and often does, compensate for these errors. Most frequently the patient's discomfort dates from an overuse of the eyes, or some impaired state of the health.

Often too the excessive muscular effort in accommodation disturbs the relation between it and convergence. Here a loss of muscular equilibrium may add another factor to the patient's unpleasant sensation, in extra ocular muscle strain. However much we may differ as to the part that aberrations of the extrinsic muscles have to do in the production of eye strain, it is a fact patent to us all that the nearer the eyes are brought to a condition simulating emmetropia, the less work is imposed on the muscular machinery concerned in the maintenance of binocular single vision.

While there is a unanimity of opinion that the grosser refractive errors, particularly astigmatism, cause these asthenopic symptoms, there still exists in the minds of a minority contingent of the profession at least, some skepticism as to any beneficial effects resulting from the correction of a low degree of astigmatism measured by the quarter dioptry cylinder.

Personally I am convinced these slight imperfections in corneal curvature often are fruitful sources of eye strain, including headaches. That I may contribute my mite in favor of the quarter dioptry cylinder, I wish to report fifty cases of asthenopia in which this glass has been the principal, in most cases, the only treatment. In a very few cases I have prescribed a collyrium for a conjunctival congestion or an ointment for a slight blepharitis, but even here the error of refraction has been considered the cause, and these local troubles manifestations of eye strain. In no case did any condition of the patient's health or extrinsic muscles seem to demand special attention. All were under 40 years of age and all were corrected with a suspended accommodation.

In collecting data for this report I have talked personally with eleven and addressed the following question to thirty-nine patients: "For what symptoms did you consult me, and what, if any, relief have you gotten from your glasses?"

Of the eleven with whom I talked ten reported satisfaction and one dissatisfaction with the glasses. From the thirty-nine letters I have received thirty-one answers, leaving eight of the whole fifty cases unheard from. Twenty-nine answered favorably, all expressing satisfaction of different degrees, with their glasses. Two answered negatively. Of the eight who failed to answer two letters were returned to the sender, their address not being the same as when they visited me. The remaining six failed to answer, either from indifference or perhaps were dissatisfied without wishing to so express themselves.

At the risk of being tedious, I wish to report a few typical cases in full. To report them all would tax your patience too much. I have made no attempt to arrange cases in groups according to symptoms, the answers being so varied it seemed difficult so to do.

Case I. Mr. B., farmer, 36 years of age, was given May 25, 1893, glasses as follows: R. E. cyl. + 0.25 D. ax. 60°; L. E. cyl. + 0.25 D. ax. 115°, with directions to wear them constantly during waking hours. While doing some work for a member of Mr. B's family, he asked if I would recommend him to a good physician, as he wished to consult him about his headaches. I suggested his eyes as a possible cause and asked him to allow me to examine them. The above glasses was the result of my examination. December 6, 1894, he says: "Since my earliest remembrance I have averaged two days a week in bed with sick headache. Never suspected my eyes as a cause. I saw well and they

gave me no pain. Since putting on my glasses, eighteen months ago, I have had headaches, but not oftener than once a month at any time. Haven't had any sickness of my stomach. My headaches are getting less and less frequent, and very much lighter. I wouldn't trade my glasses for the best farm in Kansas." February 23, 1895, he called to inform me he had been without his glasses ten days, having broken his frames. Four days after he ceased wearing them he had one of the worst attacks of sick headache he ever had. Was in bed forty-eight hours. The headache and nausea were terrible.

Case II. Prof. H., 35 years of age, principal of public schools of Newton, Kansas, consulted me June 23, 1894. He was given R. E. cyl. + 0.25 D. ax. 45°; L. E. cyl. + 0.25 D. ax. 135°, with instructions to wear the glasses constantly. January 3, 1895, he writes: "I was troubled so much with nervous headache I couldn't read ten minutes without a severe pain in my eyes and head. While I despise wearing glasses, I must say I couldn't get along without them. They have helped me so much. I can now read for hours at a time without feeling much pain or weariness from my reading."

Case III. Miss H., 18 years of age, consulted me August 3, 1894. Under ophthalmic discs of homatropin and cocain, she would not accept any spherical glass. After repeated trials I prescribed R. E. cyl. — 0.25 D. ax. 90°; L. E. cyl. + 0.25 D. ax. 90°. She had worn B. E. sph. + 0.50 D. given her by another oculist. January 3, 1895, she writes: "I could use my eyes but a few minutes until they would ache so badly I had to stop my work. Could not pursue my school studies. The glasses have helped me very much indeed. I have attended school since September and have had no trouble to keep up with my classes."

Case IV. Mr. S., 27 years of age, consulted me March 18, 1893. I prescribed R. E. cyl. + 0.25 D. ax. 180°; L. E. cyl. — 0.25 D. ax. 180°. December 6, 1894, he reports as follows: "My principal complaint was 'car sickness.' I couldn't go to Newton without having a terrible headache. My business frequently calls me to New England and I dreaded the trips. While riding at night I would have no trouble, but in the day time, if I kept my eyes open, I would suffer terribly. I have just returned from such a trip and I wore my glasses every waking minute, and I haven't had a headache during my whole trip."

Case V. Edna D., 10 years of age, was referred to me by Dr. J. E. Oldham for an examination of the eyes to see if I could find

cause for obstinate headaches. Finding astigmatism with greatest corneal curvature horizontally, I prescribed (August 6, 1894,) B. E. cyl. + 0.25 D. ax. 180° , and told her to wear her glasses all the time. January 5, 1895, her mother reports: "Headaches very much improved. Has hardly complained at all for the last month. Goes to school steadily."

Case VI. Mrs. S., 26 years of age, consulted me about her eyes May 1, 1893. She complained of some discomfort on use, but principally of a succession of styes that were most annoying. I gave her B. E. cyl. + 0.25 D. ax. 90° . January 10, 1895, she wrote: "I never read or sew without my glasses. I have had but one styne since. They have benefitted my eyes greatly."

Case VII. Mrs. P., 23 years of age, was given B. E. cyl. + 0.25 D. ax. 90° , June 9, 1894. January 9, 1895, she wrote: "My principal complaints were painful, burning sensations in eyeballs. I couldn't use my eyes any length of time without causing me to have severe headaches. They were very sensitive to light, often had a dimness of vision while using them; could scarcely see at times. I have had no headache since I got my glasses. I am compelled to wear them all the time, as it seems as if the light was too strong without them. I have gotten much relief from my glasses for which I am very thankful."

Case VIII. Inez N., 12 years of age, was given B. E. cyl. + 0.25 D. ax. 180° , March 26, 1894. January 2, 1895, Mrs. N. writes me: "Inez complained of blurring of words when reading, and of objects when looking steadily at them, and of darting pains in the eyes. Since she commenced wearing her glasses she never has complained of pain or blurring."

Case IX. Miss P., 22 years of age, was given B. E. cyl. + 0.25 D. ax. 180° , August 10, 1894. January 2, 1895, she states: "I have been greatly benefitted by my glasses. The headaches I suffered so much from have been very greatly relieved. My eyes do not ache now. I am very much pleased with the glasses."

Case X. Miss S., 19 years of age, was sent to me by Dr. Sippey, of Garden Plain, Kansas. She was given B. E. cyl. + 0.25 D. ax. 180° , May 13, 1893. January 7, 1895, she writes: "My trouble was headache. I wore the glasses for nearly a year, and am sorry to say received no benefit from them."

Case XI. Miss W., 22 years of age, was fitted with glasses June 9, 1894, R. E. cyl. + 0.25 D. ax. 105° ; L. E. cyl. + 0.25 D. ax. 75° . January 19, 1895, she writes: "Have worn the glasses constantly. They not only have relieved my eyes of that

aching feeling, but have rendered them so strong that I use them in my work as a teacher, without fatigue."

Case XII. Mrs. H., 25 years of age, was sent to me by Dr. Spitler February 10, 1894. She was given R. E. cyl. + 0.25 D. ax. 60°; L. E. cyl. + 0.25 D. ax. 120°. January 8, 1895, she writes: "My eyes would pain me very much and become red and inflamed on use. When I first commenced wearing my glasses objects seemed tilted one side and the floor did not seem level. After one or two weeks these sensations passed away. While my eyes still trouble me some, my glasses are of great assistance in reading or sewing."

Case XIII. Mr. H., 38 years of age, farmer, referred to me by Dr. Burton for relief from aching eyes and head. November 14, 1893, he was given R. E. cyl. + 0.25 D. ax. 135°; L. E. cyl. + 0.25 D. ax. 45°. January 14, 1895, he reports: "I suffered from sick headache once or twice a month for years. For past year could use my eyes but a few minutes at a time; they would itch and burn, and the light, both natural and artificial, would give me great distress. Had to shade them almost constantly. Have worn my glasses two months. For a few days when I first began wearing them I felt as though I was standing on my head, they made me so dizzy. I persisted in wearing them constantly, and now they are all right. I haven't had a headache since, and can read by lamp light two or three hours without discomfort."

Case XIV. Mr. J., 38 years of age, consulted me October 6, 1894, about a severe blepharitis marginalis and conjunctival congestion, stating that he had spent much time and money trying to get a cure, but he had failed. Had never had glasses suggested. He declared his eyes never gave him any discomfort, though the redness of his lid margins was so conspicuous as to amount almost to a deformity. I ordered B. E. cyl. + 0.25 D. ax. 180°, advising him to wear them all the time; also gave him an eye wash and yellow oxid of mercury ointment. January 15, 1895, he writes: "My eyes are slowly improving. Think if I would wear my glasses all the time, as you advised me, they would get well. I only wear them in close work, disliking so much to wear them at other times. They certainly have greatly benefitted my eyes."

Case XV. Miss F., seamstress, 19 years of age, referred to me November 29, 1893, by Dr. Hupp for an examination of eyes for headache, which he had been unable to relieve. I prescribed B. E. cyl. + 0.25 D. ax. 90°. January 7, 1895, she informs me:

"My eyes are easy and I have no more headaches so long as I wear my glasses, but when I try to do without them there is trouble."

Case XVI. Mr. M., 28 years of age, student, was given September 1, 1894, B. E. cyl. + 0.25 D. ax. 180° , hoping to relieve obstinate asthenopic symptoms, and a conjunctival congestion. January 5, 1895, he writes to me: "The result of your work is not entirely satisfactory. Since I commenced using the glasses I find it quite impossible to do without them. At present I am able to do three hours' more work a day than I could before I received the glasses. The redness of my eyes sometimes disappears entirely; at other times they get very red."

Case XVII. Miss A., dressmaker, 23 years of age, sent me by Dr. Fabrique, was given, February 3, 1894, R. E. cyl. + 0.25 D. ax. 90° ; L. E. cyl. + 0.25 D. ax. 135° . January 2, 1895, she reports: "I cannot do without my glasses, even for distance. Without them my eyes tire and blur, and get red. I wouldn't think of doing without them."

Case XVIII. Miss D., 21 years of age, consulted me December 18, 1893, for headache and uncomfortable eyes, caused by sewing or reading. I ordered R. E. cyl. + 0.25 D. ax. 135° ; L. E. cyl. + 0.25 D. ax. 45° . January 4, 1895, at my request, she called to inform me that she had not worn her glasses. She had tried, but they had made her dizzy, and she had given up trying to wear them. I examined her eyes again and found she accepted the same glasses. After encouraging her to give them a further trial she departed promising to report some future time."

Case XIX. Miss S., 19 years of age, school girl, referred to me by Dr. Fabrique. She was given, January 3, 1893, R. E. cyl. + 0.25 D. ax. 180° ; L. E. cyl. + 0.25 D. ax. 165° . January 15, 1895, she writes: "I suffered continually from headaches and pain in my eyes, especially after reading or study. The glasses have relieved me entirely, and I anticipate no further trouble."

Case XX. Chas. C., 15 years of age, consulted me October 13, 1894, for "aching eyes," would water much on use. Examination showed about 5 D. of hypermetropia, and much amblyopia of right eye. Left eye accepted sph. + 0.50 D. \odot cyl. + 0.25 D. ax. 150° , giving him vision $\frac{3}{8}$. He was given a plane glass for right, and the above cylinder for left eye. January 15, 1895, he writes: "I go to school regularly, and wear my glasses all the time. While wearing them my eyes neither water or ache."

Case XXI. Walter H., 15 years of age, consulted me September 2, 1894, complaining much of headache, tired and watery eyes after looking at a book for a short time. He was given R. E. cyl. + 0.25 D. ax. 120°; L. E. cyl. + 0.25 D. ax. 90°. January 3, 1895, his father writes: "His difficulties seem to be entirely overcome by the use of his glasses."

I have no confidence in my ability to diagnose these slight degrees of astigmatism with any objective test. My reliance is a mydriatic, with trial case, test types and astigmatic card.

If there is any axial ametropia, I correct it with the spherical glass giving best vision, and then proceed with my cylinders; directing my patient's attention to the astigmatic card, resembling a wheel, I ask him if he discovers that each spoke contains three black lines and two white spaces? If he answers in the affirmative, as he no doubt will, I ask him to look carefully and see if he discerns the white spaces in each spoke equally distinct in all directions? If astigmatism is present, even of low degree, and the patient is a close observer, he will tell that in one direction the white spaces are indistinct or absent, giving an appearance of a solid black line. Adding now the correcting cylindrical glass at a proper angle, the spokes will all appear alike. When tested with Snellen's type at twenty feet, the same glass ought, and will, give the sharpest definition of vision.

Dr. Price, of Nashville, Tenn., has suggested that the exact axis of our glass can best be gotten with a stronger cylinder, a suggestion of value, which I have often put in practice.

In confirming results, I prize the crossed cylinder of Jackson, finding it of great assistance to the patient in determining the exact strength of the cylinder.

Dr. Prince, of Springfield, Ill., suggests the abandonment of the heavy trial frame with rotating cells which accompanies our trial cases. They have always seemed cumbersome to me, for which reason I do not use them. The simple cell is much lighter and more convenient. With it, by reversing their surfaces, cylinders with axes mounted at forty-five degrees, can be made to assume any angle.

SUMMARY: I found normal vision, without glasses, in forty-eight cases. Two cases had $\frac{3}{8}$, raised to $\frac{3}{8}$ with the cylinders. In both cases their apparent error was corrected with a minus cylinder, while the mydriatic correction required plus cylinders, of same strength, with axes at right angles. I always prefer the plus cylinder.

In two cases there were no symptoms whatever referable to the eyes; one of migraine, and one with blepharitis and conjunctival congestion.

Headaches were found a frequent symptom. With Dr. Chisholm, of Baltimore, who has so ably championed the quarter dioptry cylinder, I confidently expect to find astigmatism, oftenest of slight degree, in these headache cases, particularly if there is any associated complaint of eye distress. If headaches improve under a mydriatic, I confidently prognosticate relief from glasses. Here, as in all other cases, I much prefer atropin, having most confidence in its cyclophlegic properties, and liking too, the therapeutic effect of the prolonged rest given the eyes by that mydriatic.

There were numerous complaints of photophobia. It is a distressing symptom. Patients complain that both direct and reflected rays of light are painful, the former from their intensity; the latter probably from the acquired additional heat given them by our stone walks and asphalt pavements.

A frequent complaint from cylinders, with axes placed obliquely, comes from disturbed ocular perceptions, with consequent dizziness and sometimes nausea. In my experience, these sensations soon disappear under constant use of the glasses. On account of dizzy sensations, one of my patients ceased wearing her glasses before she had given them a fair trial.

Of my fifty cases, thirty-nine have reported satisfactory results, and three unsatisfactory. Counting the eight not heard from as failures, we still have left a percentage of success of seventy-eight.

In my humble judgement, the quarter dioptry cylinder has come to stay. So long as my patients continue to express relief from distressing symptoms, I shall continue to prescribe it. It is not "a superfluous placebo." On the contrary, in intelligently selected cases it is a remedy of great value both to the oculist and his patient.

127 N. Market Street.

TETANUS FOLLOWING WOUND OF LOWER EYELID.

BY GEORGE F. KEIPER, A. M., M. D.,

OF LAFAYETTE, IND.

OPHTHALMIC AND AURAL SURGEON TO ST. ELIZABETH HOSPITAL, ST. JOSEPH
ORPHAN ASYLUM, ETC.

EMMET N., 15 years of age, was brought to the office on May 18, because of double vision and inability to close the lids of the right eye. The right eyebrow was markedly arched. The orbicularis was paralyzed. The paralysis of the inferior oblique required a prism of 8° to neutralize it. On the lower lid, in its center, two lines from its edge, was a vertical scar about one half inch long, which he received from a wound made by a horse weed thrown by a companion while bathing in the river just nine days before. He said it required some force to pull it out, and that his companions picked out several pieces afterward. No attention was paid to it, however. Nothing further could be learned from his history. The next day his mother remarked that she had noticed him forgetful about certain matters to which no attention had hitherto been paid. Suspicion was immediately aroused that he had had an accident whereby "his head was hurt." That he denied, and his mother knew nothing of it. Since his death, a patient, a boy, told me he saw him fall very heavily from his bicycle four weeks before his death and strike his head.

The examination of the retinae revealed no abnormality. The boy was weak and poorly nourished. I ordered syr. ferri iodid in 20 minim doses every four hours, and dilated his pupils with atropin to prevent him reading. The right eye was bandaged to avoid confusion. At 10:30 the next morning I was hastily summoned to his home, and I found him suffering severe pain, and I

was informed that he had slept none the night before. It gave him much pain to expose his tongue. I prescribed a mixture containing 10 grains each of bromid of potassium and chloral, to be given every hour until he slept, when it was to be discontinued. He took 5 grains of calomel also. At 5 o'clock, at the time of my visit, he was asleep. The bromid and chloral mixture was ordered continued as occasion required. The next morning, at 6 o'clock, his father hastily summoned me and arriving at the house, I found him in a condition of tetanus. The jaws were well set and the sternomastoids prominent, and both eyebrows markedly arched. The bromid and chloral mixture was directed to be given every half hour, and I requested that the family physician be called. Dr. Hupe and I met at 8 A. M., and the case was placed in his charge. The family requested me to continue attention to his eyes, which I did with a feeling of hopelessness. All the remedies usually used in such cases, especially the bromid and chloral, were pushed heavily. A consultation was held the same evening, with no hope expressed. The case continued thus until May 22, when he died at 5 A. M., during all of the time he was in a condition of opisthotonos frequently. The report of a similar case by Drs. Fromaget and Cabannes, of Bordeaux, is to be found in the *Annales d'Oculistique*, January, 1895.

GALLICIN, A GALLIC ACID DERIVATIVE—ITS USE
IN THE TREATMENT OF EYE DISEASES.BY GEORGE F. SUKER, M. D.,
OF TOLEDO, OHIO.

THIS preparation of gallic acid, gallicin, was first used in ophthalmic practice by Dr. Carl Mellinger, Privat-Docent in the University of Basel. He has given it a fair trial, having used it for over a year, and finds it very efficacious in every respect. One main feature is its prompt action, then, too, it is void of untoward effects. That it might be indicated in certain catarrhal affections of the eye, is to be judged from its close relationship, chemically and therapeutically, to resorcin ($C_6 H_6 O_2$) and pyrogallol ($C_6 H_6 O_3$), which, as we know, are highly recommended for their efficiency in the treatment of catarrhal inflammations.

Gallicin is the methylic ether of gallic acid, and as such possesses the formula $C_6 H_2 (O H)_3 COO CH_3$. It is made by heating a methyl-alcoholic solution of gallic acid or tannic acid with hydrochloric acid gas or concentrated sulphuric acid.¹ When recrystallized from methylic alcohol it forms anhydrous rhombic prisms; and from hot water it crystallizes on cooling in the form of delicate, fleecy, snow-white needles. The latter being better adapted for therapeutic uses. Both preparations melt at a temperature of 200° to 202° . It is readily soluble in hot water, and in warm methylic and ethylic alcohols, and also in ether; the solution being colorless. Gallicin is more preferable than pyrogallol in that it possesses no poisonous properties. It is generally used in a powdered form, and is applied as we apply calomel, *i. e.*, with a fine camel's hair brush, or simply dusted on to the parts. Applications are usually made twice daily, though once will often suffice.

¹ *Correspondenzblatt für schweizer Aerzte*, Vol. XXV., p. 231.

Occasionally after the application of gallicin, the patient experiences a burning sensation, which can be partially allayed by a cold douche, or entirely relieved by the instillation of a few drops of a 2 per cent solution of hydrochlorat of cocain.

Dr. Mellinger has tried it in about 200 cases, and makes a most favorable report of its use. He says it is applicable in any form of catarrhal conjunctivitis, and especially is it of value in those cases where there is a chronic swollen condition of the mucous membrane with a more or less ropy discharge accompanied by an eczematous condition of the palpebral edge. In this class of cases its two-fold action comes into play, *e. g.*, for the catarrhal conditions, and for the skin affections.

Again, it is of great service in cases of catarrhal affections following septic infection, or in severe inflammation, such as is seen in the subsiding of a panophthalmitis or hypopyon keratitis. Furthermore, gallicin is of benefit in the follicular form of conjunctivitis, either acute or chronic. It is of value after cataract extraction, if a catarrhal condition supervenes, the troublesome secretion ceasing after four or five applications.

The close relationship it bears to resorcin and pyrogallol suggested its use in eczematous conditions of the eyelids for the relief of which it has proved very efficacious. In cases of phlyctenular conjunctivitis it is noticeable that after one or two applications of gallicin, the peripheral phlyctenules disappear rapidly. Gallicin is fully as good, if not better, than calomel in phlyctenular affections with copious secretions. In such cases calomel has a tendency to increase rather than decrease the discharge. In superficial keratitis, gallicin is of great value, as it renders a prompt resolution and clearing up of the cornea. I have confirmed these observations in the treatment of thirty cases. We can sum up the therapeutic value of gallicin as follows: It is applicable in all cases of catarrhal affections of the mucous membrane of the eye, either with or without secondary eczema; in cases of phlyctenular keratitis or conjunctivitis; and exceedingly serviceable in follicular conditions, and in superficial keratitis.

Gallicin is indeed worthy of trial, and in the future will, no doubt, play an important role in the treatment of the above named diseases. It is best employed in the powdered form; and, being very light, about 1 centigram is sufficient for an application. It is to be applied once or twice daily as deemed expedient.

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REPORT OF A CASE IN COUNTER EVIDENCE TO THE INFECTIOUS THEORY OF SYMPATHETIC OPHTHALMIA.¹

BY H. L. HILGARTNER, M. D.,
OF AUSTIN, TEXAS.

IN spite of the numerous observations and experiments on the subject, we are to-day far from clear as to the pathogenesis of sympathetic ophthalmia. There was a time when this problem seemed solved beyond a doubt by Deutschmann's investigations, but during the past few years his theory has met with so many objections in Germany, France, England and America that a doubt as to the value of his results can no longer be overcome.

Nearly fifty years ago William MacKenzie summed up his conception of sympathetic ophthalmia in the following words: (MacKenzie, *Diseases of the Eye*, Fourth Edition, p. 597, 1885). "I think the chief medium through which sympathetic ophthalmitis is excited is the union of the optic nerves." This theory found most general acceptance among ophthalmologists, until the appearance of Heinrich Müller's investigations fifteen years later. Müller² endeavored to find the channel of communication in the ciliary nerves. His conclusions were drawn from the anatomical examination of three eyes which had been enucleated through fear of sympathetic disease in the fellow eye. While conceding the possibility of inflammatory transmission along the optic nerves, "the irido choroiditis of the first eye," he says, has progressed so far that advanced atrophy of the optic nerve is present. The nerve is nothing more than a fibrous cord, incapable longer of conducting an irritation, or indeed any other process, so that simply cutting through the optic nerve will not lessen the chances of sympathetic trouble. The ciliary nerves, on the other hand, do not easily atrophy.

¹ Read before the Texas State Medical Association, April 25, 1895.

² *Crawford's Archives* iv., p. 367-370.

The majority of eye diseases attack the anterior half of the eye, and consequently the ciliary nerves from their position would be more exposed to irritation. And when the inflammation of the second eye makes its appearance under the garb of irido-choroiditis as it frequently does, it is far more logical for us to assume that the inflammation was brought about through the ciliary nerves than through the optic nerve. It is not improbable that the ciliary nerves exercise some direct influence upon the nutrition of the retina and optic nerve.

Muller's ciliary nerve theory seems to me to find confirmation in the following case in my own experience:

In September, 1894, Wm. McD., 14 years of age, came to the Blind Institute at Austin, Texas, with the following history: Twelve years ago he stuck a knife blade into his left eye, causing loss of sight in the wounded organ within three days. From the time of the infliction of the injury until the patient came under my notice, he suffered intervals of pain from the injured eye, which were attended by sensitiveness in the fellow eye. Examination disclosed that the left ball was very much shrunken, besides being abnormally sensitive to light and touch. A cicatrix was found extending from the sclero-corneal junction to the center of the cornea. Upon first examination I noted patient lowered his head continually to avoid as far as possible exposure to light, complaining at the same time of pain in the unhurt eye. Upon close examination faint ciliary injection was discovered in the latter organ. The patient was advised to have the left eye removed, and on the following day the operation was performed. The stump being removed and examined, revealed a calcareous condition of the interior, including everything within the sclerotic coat. The right eye was promptly treated with atropin, and patient remained in dark room for several days, the treatment being continued until all apparent inflammation had subsided and recovery seemed secured. Two weeks later the patient attempted to read, with the result that on the day after, the pain in the eye returned, and upon examination ciliary injection was again disclosed. The pupil was very much contracted and did not respond to light. The treatment formerly pursued was repeated with the addition of hot fomentations, and after ten days recovery seemed complete, the atropin being continued, however, for one week thereafter.

During the second attack in the good eye, the empty socket was carefully examined and revealed no cause for the irritation in the fellow organ. Between four and five weeks after atropin had

been discontinued, the patient again attempted to read, with the same result, except that the new attack was far more tedious and stubborn than the preceding one, although it yielded to treatment after two weeks. The patient continued comfortable for one month after the ciliary muscle regained its power, when, though cautioned not to attempt as yet to use the eye, the injunction was disobeyed with a result far more serious than before, and for a time seemingly hopeless of remedial treatment. After the subsidence of inflammation, realizing the danger of any similar indiscretion on the part of the patient, the eye was kept continually under the influence of atropin for two months. After the lapse of several months since the recovery of ciliary action the eye now seems to be entirely normal.

Before the removal of the diseased eye, sympathetic irritation had begun in the ciliary nerves, as evidenced by the repeated inflammatory symptoms following ciliary action of the right eye. It seems therefore evident from the subsequent history of the case, that the enucleation of the diseased eye was not adequate to the removal of all irritation in the ciliary nerves, for that irritation manifested itself with continually increasing violence on repeated subsequent excitations.

It seems clear that the diseased condition of the nerves remained dormant for a while, and so far from manifesting a tendency towards abatement, only awaited the occasion for its development.

The counter theory of Deutschmann and his school would explain the case above cited on the hypothesis of parasitic infection.

The reasonableness of this theory of an infectious origin for sympathetic ophthalmia, no doubt accounts for its acceptance; yet this theory owes almost its entire support to a few experiments with pus organisms. Now it is well known that the pus organism does not produce sympathetic ophthalmia, as is proven in panophthalmitis when these organisms, though most abundant, do not as a rule give rise to sympathetic ophthalmia. Deutschmann's³ views depend upon the bacteriological examination of seventeen eyes, which had caused sympathetic ophthalmia, and in every case, save one, organisms were found, and as regards this (one) negative result, he says: "It proves that no organisms were found in my sections and does not prove that there were no organisms anywhere present in the eyeball." In the majority of cases these micro-organisms were found also in the optic nerve and its sheaths.

³ *Archiv. Ophthalm.*, Vol. XXII., p. 303, 1893.

Wangemann demonstrates the presence of organisms in two eyes which had given rise to sympathetic ophthalmia.

Deutschmann's work has been repeated by Alt, Gifford, Mazza, Randolph, Ulrich, Limbourg, Levy and Richard Greef, but every one got only negative results.

Richard Greef⁴ says: "A systematic examination was gone through in five cases where sympathetic ophthalmia had developed, and notwithstanding the most careful bacteriological examinations according to the various methods, no organisms were found." Similar results are reported by Nordenson, Ayres, Alt, Berry, Schmidt-Rimpler, Trousseau, Poncet and Uhltoff.

Deutschmann⁵ rarely failed to find organisms in an eye enucleated to avoid sympathetic trouble. Randolph examined no less than a score of such eyes, and succeeded in detecting organisms in but one case and that was when the injury dated only two weeks back; a fact which seems to warrant the conclusion that the very questionable agency of micro-organisms in the production of sympathetic ophthalmia is rendered more unlikely when the sympathetic disturbance makes its appearance from two to six months after the injury.

Ohlmann⁶ records thirty eyes enucleated to avoid sympathetic trouble, and in not a single one did he find organisms.

Cases in which a considerable period elapsed between the injury and the outbreak of the sympathetic inflammation can hardly be accounted for on this theory for the micro-organisms in the optic nerve of the injured eye would have perished long before the appearance of the disease in the injured eye.

Richard Greef⁷ examined the ends of optic nerves in fourteen cases where neurectomy was made for fear of sympathetic disease, and in not a single instance did he find organisms, either in the optic nerve or its sheath.

Innumerable other investigations might be adduced, which, like the above, fail entirely to verify the conclusions of Deutschmann, and point rather to the positive conclusion that the micro-organism is in the majority of cases not present as an exciting cause.

Collecting the results of our investigation, it would seem clear from the case above cited that the lapse of twelve years between the injury and the outbreak of the sympathetic trouble in the other

⁴ *Archiv. Ophthalm.*, Vol. XXII, p. 302, 1893.

⁵ *Archiv. Ophthalm.*, Vol. XXI., p. 373.

⁶ *Archiv. f. Augen.*, Bd. 22, 1.

⁷ *Archiv. Ophthalm.*, Vol. XXII., p. 303.

eye must have annihilated any micro-organic agency as a factor in the case. Such a period of time far transcends any scientifically established term of life for such organisms, nor does it seem possible that their operation would have remained for so long a time in abeyance, even on the assumption of their presence in the system.

In conclusion, it seems most probable that the pathological symptoms in the uninjured eye resulted from a purely mechanical irritation, propagated from the diseased organ before its removal, and asserting itself after that removal with steadily increasing violence until rest and treatment restored the normal state.

RELATIONSHIP BETWEEN DISEASES OF THE
EYE AND BRAIN.¹BY ROBERT FIELDS LEMON, A. M., M. D.,
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PROFESSOR OF DISEASES OF THE EYE AND EAR IN GROSS MEDICAL COLLEGE.

THE intimate association, physiologic and pathologic, of the eye and the brain has been overlooked to a very great extent by nearly all writers on ophthalmology, and to a less degree by the authors of works on diseases of the brain and nervous system. Reasoning from the close nervous connection existing between eye and brain, we are at once impressed with the clinical importance of the interdependence of these two wonderfully sensitive organs. In the course of a somewhat extensive ophthalmic practice during the past few years, I have met with a considerable number of cases which to my mind demonstrated vividly that this relationship should be better understood. A desire to acquire a clearer understanding of the subject myself, and possibly to bring out a discussion, was the incentive which prompted me to write this paper.

Even as late as 1859, the great ophthalmologist and scientist, Donders, who was then at his zenith in the development of optics as regards the laws of refraction and accommodation, brought to light a term hitherto unknown in its real significance—astigmatism; a word whose meaning our school children are now being taught. When this condition, astigmatism, is present only to a limited degree, it may cause what has been called for ages supra-orbital neuralgia. Viewing the matter just in a cursory way, do we understand how this pain is produced? Astigmatism, simply defined, is a congenital deformity, a lack of symmetry in the form of the eyeball. Do we mean to say, regarding the pain in this

¹ Read before the Colorado State Medical Association, June 18, 1895.

region, that the eye itself is in pain? By no means. The eye is in a fair state of health, with total absence of any inflammatory condition. We must say then that there has been communicated to the brain, the great mother of the nervous system, the fact that her dearest child is unable to do good work in refracting rays of light upon the fundus oculi, and this good mother is in distress on account of her child's deformity. But when the astigmatism is of a severe and complicated type there results an inflammatory condition which causes decided disturbance of the functions of the eye regarding sight. For instance, if the highly astigmatic eye cannot abstain from trying to perform labor for which it is not adapted and which is so severe in its effects on its mother, the brain, she must of necessity resort to some means by which the eye shall be given rest. Thus an inflammatory condition is set up by the brain withdrawing her power of vital resistance, and the impending forces at once attack this eye and it becomes congested, not only in its ocular and palpebral surfaces, but the deeper recesses and the essential mechanism of the organ, such as the ciliary process and the retina, are involved. Then the orbicularis muscle is commanded to shut off the light from the inflamed eye, and by these means the organ of vision is put in a comparative state of rest. Do we understand that the case portrayed is solely and distinctively an eye trouble? We do not; its cause originated at a given point, and, like a telegraphic message, word has been sent to the brain that the eye was in trouble; and, after deliberating over this complicated condition, the brain decided it was best to take the course described. By this assault upon the structures of the eye, supra-orbital neuralgia is relieved or prevented, and the inflammatory condition of the organ on the outside of the brain has been placed in its stead; by this means the seat of power has been protected and one of her branches only suffers. How interesting it is to reason on these conditions and to learn how nature protects her interests at every conceivable point, thereby preserving her pristine vitality. The beautiful provision of nature in the case stated is this: While the eyes only are impaired, the other parts of the system may be in good working order, performing all their functions without difficulty. But if the central irritation should have been continued, an inflammatory state of the seat of the nervous system would certainly have resulted; and this possibly might have terminated in a degenerative process to whose deadly influence, sooner or later, the brain would have been forced to succumb.

Optic neuritis is another well-defined disease of the eye which, in a majority of instances, points to brain complication. If a patient is suffering with continuous headache in optic neuritis, it is always indicative of serious disease, and if you can exclude three constitutional disorders, namely: anemia, kidney disease, and lead poisoning, and if, moreover, the headache is accompanied by vomiting, there is scarcely one chance in a hundred to fail in a diagnosis of a central lesion most probably tumor. The ophthalmoscope should never be neglected in cases of severe headache; it often leads us directly to a diagnosis.

Some time ago a lady was brought to me suffering with continuous headache which had been a source of annoyance for several months. Her vision was very much impaired; she read $\frac{3}{80}$ with one eye and $\frac{1}{80}$ with the other. Her vision had been failing continuously for six months. When I examined her with the ophthalmoscope I found a well-defined case of optic neuritis, the opacity of the disc being dense and striated. The only symptom which she had shown indicating disease prior to this eye trouble, was a slight unsteadiness of gait from which she claimed she had long since recovered. I suspected a central brain lesion, and so informed her attendant. I discouraged any treatment so far as the eye affection was concerned. She returned to her family physician. About a month later I was informed that she had succumbed to the disease and that a post-mortem showed a central brain tumor.

Optic atrophy, when not a sequel of neuritis, is generally a symptom of degenerative disease of the central nervous system. To undertake to classify all the different forms of atrophy is not necessary on this occasion; neither is it satisfactory, for there are so many exceptions that the rule is nullified in many cases. So, for convenience and to save time, I will merely mention the progressive forms as being especially destructive, whether from multiple sclerosis, locomotor ataxy, syphilis, or embolism of the central artery. Atrophy from pressure of a tumor on the nerve is comparatively uncommon, as only a small proportion of the intracranial tumors are situated in this vicinity. Hemorrhage by compression, exostosis, cheesy tubercular masses, neoplasms, and hydrocephalus internus, are all quite common causes of atrophy by pressure about the chiasm. In all cases of early atrophic disease of the nerve it is well to measure the amount of vision and ascertain if any great error of refraction is present. We invariably have diminution of color perception and a contracted field. In order to determine whether there is really disease of the optic

nerve or whether it is a central brain lesion, just observe the following rule: The reaction of the pupil to light is lessened in diseases of the nerve, but not in diseases of the brain.

Inequality of pupils, unless it has been present from childhood, is nearly always indicative of a lesion of some character along the optic tract. When not due to this cause it possibly has been brought about by paralysis of a branch of the third nerve, following a long siege of sickness—typhoid fever, scarlet fever, diphtheria and whooping cough all predisposing to this condition. If the pupillary inequality cannot be traced to one of these causes, it is a good idea to seek for intra-cranial complications, and don't forget in cases of this kind to test for color blindness and to measure the visual field, as we often have small spaces like little scotomata producing a break in the field of vision as well as deterioration of color perception.

Aneurism. We sometimes find optic neuritis appearing in this affection, but it is not usual unless the aneurism is near the optic nerve, for instance, in the internal carotid or anterior cerebral artery. Total loss of sight of one eye, which after a time extends to the other, causing complete blindness, often occurs without the slightest ocular disturbance save the constant failure of sight. In the beginning of a disturbance like this we frequently have a symptom known as hemianopsia, a permanent defect of half the visual field of both eyes from pressure on the tract, or chiasm; and sometimes from a functional disturbance of the optic centers in one cerebral hemisphere. The hemianopsia is usually either monolateral or bilateral, the latter variety affecting the external half of one field and the internal half of the other; the former the temporal or nasal half of each eye. Bi-nasal hemianopsia can exist only as a symmetrical disease of both optic nerves, pressure upon external part of each nerve. Bi-temporal hemianopsia, loss of the outer half of each field of vision, always means damage to the internal half of each nerve in front of the chiasm, and this would necessarily injure the fibers of each nasal half of the retina. The complete loss of one eye functionally and the other left undisturbed, signifies derangement of the nerve between the chiasm and the external part of the optic foramen. I think I have mentioned all the principal regional points which are requisite to properly understand the several forms of lack of visual acuity due to lesions along the optic tracts. In hemianopsia the color sense is usually found to be perfect in the unaffected half of the visual field. Paralysis of the third nerve, without impairment of sight, is gener-

ally produced by aneurism of the posterior cerebral and communicating arteries.

For want of time, many diseases have been omitted which have more or less bearing upon this rare field. I have tried to discuss those only which are complicated the most often with brain trouble. Concussion, compression, and laceration of the brain involve the eye oftentimes, and in many instances the *ophthalmoscope especially*, and also the perimeter, aids very materially in arriving at a correct and satisfactory diagnosis as to the graveness of the injury.

A CASE OF GUNSHOT INJURY INVOLVING BOTH
EYES, STUDIED NINE YEARS AFTER
THE ACCIDENT.

BY ROBERT R. SAUNDERS, M. D.,

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THE following case presents certain features of sufficient interest for brief record:

J. H., a man 21 years of age, presented himself for treatment on June 16, 1895, and gave the following history: On September 26, 1886, he was accidentally shot by a companion. Bird shot entered his right arm, chest and face, and one shot was found imbedded in the sclera of the right eye near the outer canthus, while another shot was removed from the same eye above the inner canthus.

At that time he was under the care of Dr. Charles Schaffner, who very kindly has permitted me to incorporate his notes of the case:

"October 7, 1886, J. H., 13 years of age, accidentally shot in both eyes twelve days ago.

"O. D. vision = $\frac{5}{17}$; J. 8, from 10 to 50 inches. The ophthalmoscope reveals a discolored and congested optic disc; many streaks of lymph and small clots, together with glistening spots of choroidal change in outer half of the fundus oculi, and a limited separation of the retina in the lower portion, together with a hemorrhage in the vitreous. A small shot was found sticking in the right eye near the outer canthus.

"O. S. vision equals light perception. A shot had penetrated the lower and inner border of the cornea, and is probably located in the vitreous, although examination of the deeper structures is impossible, owing to the traumatic cataract which is present. The tension is diminished."

Under Dr. Shaffner's treatment, the right eye gradually improved, and one month later the vision was $\frac{3}{8}$. By January 4, 1887, the vision had risen to $\frac{3}{8}$, and he was able to read the finest print, from $3\frac{1}{2}$ to 11 inches.

The ophthalmoscope at that time revealed slight clouding of the optic disc, and a greenish white scar in the lower floor of the eye, extending in the form of a streak from the far periphery of the eye-ground almost to the optic disc. The left eye had in the mean time passed into a condition of atrophy. Enucleation was advised, after consultation with Dr. Strawbridge, but declined. The shot was removed from the sclera of the right eye.

The patient has suffered no inconvenience since the accident to the present time, and comes now for correction of his refractive error.

On studying the right eye under thorough mydriasis, the following interesting lesions were discovered:

The media are clear, the disc is nearly round, its edges are hazy and the scleral ring is broadened to the nasal side. The veins are rather full and there is slight infiltration of the arterial lymph sheaths. The macula is represented by an oval, ring-shaped area, with a crescent below it, and beyond this a patch of shifting reflex. On the lower temporal artery, as it curves to the macula, there is a somewhat conical patch of lymph. Two and one-half diameters from the inferior border of the nerve-head begins a broad rent in the choroid and retina, which widens out towards its center and then becomes narrow as it extends forward; it extends as far forward as ophthalmoscopic examination is possible. The floor of this rent is composed of glistening-white, exposed sclera, and its edges are bordered with streaks of pigment. At its upper end there is a prolongation in which the choroid has not been absorbed and across which the larger choroidal vessels can be seen. Up and out from the disc, in the far periphery of the eye-ground, there is a patch of atrophy, the lower border of which begins in a mass of pigment. The atrophic area, expanding into a fan-shaped extension, can be followed as far upward as ophthalmoscopic examination is possible.

The tension of the left eye is diminished, but the eye is not tender on pressure. The iris is incarcerated in a scar situated at the lower and inner corneal limbus, and the pupil extends as a slit up and out from this point, and is bound down at all points to the capsule of the lens, the iris tissue itself bulging forward in the form of the so-called iris bombè. The anterior chamber is practically obliterated. Through the pupil remains of the cataractous lens are discernable,

There seems very little doubt, both from the clinical history kindly furnished by Dr. Shaffner, and also from present ophthalmoscopic examination that a shot entered the right eye below the

cornea, penetrated the sclera, choroid and retina, passed across the vitreous and emerged at a point up and out from the disc, the wound of entrance, so far as the fundus oculi is concerned, being now marked by the lower patch of atrophy, and the wound of exit by the fan-shaped area situated in the upper portion of the eye-ground. With the exception of these lesions, so situated as not to interfere with direct vision, there are only a few remnants of the former choroiditis which existed and is described in Dr. Shaffner's notes, namely, the patches of lymph and slight changes in the pigment below the macula.

Careful search in the sclera fails to reveal with certainty any scar indicating the point of entrance of the shot or its exit, but as the shot which were known to exist there and were extracted by Dr. Shaffner have also left no scars, this is not a remarkable circumstance.

It is interesting to note that although the pathologic lesions obtain in the left eye which are not infrequently followed by sympathetic irritation, or even inflammation, no such signs have ever occurred.

So far as the right eye is concerned, the case may be relegated to those in which an unusual traumatism has been followed by complete restoration of the visual functions, and is particularly interesting from the ophthalmoscopic standpoint, inasmuch as the present lesions can be compared with those studied by Dr. Shaffner a few days after the injury, nearly nine years ago.

A CASE OF RETENTION OF A METALLIC SPLINTER
IN A BLIND EYE FOR SEVENTEEN YEARS
WITHOUT THE OCCURRENCE OF SYM-
PATHETIC INFLAMMATION.

A CASE OF MEMBRANA PUPILLARIS PERSEVERANS
IN BOTH EYES IN AN ADULT.

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OF FORT LEAVENWORTH, KAN.

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MRS. M., 19 years of age, of Leavenworth, Kan., lost her left eye seventeen years ago, under the following circumstances: While watching a little playmate, who was engaged in exploding percussion caps by placing them upon a piece of iron and striking them with a hammer, something struck the cornea between the open lids, and opened the anterior chamber. The mother states that she saw the eye immediately, and that when she pulled the lids apart a piece of cap fell out from between them. This assertion on the part of the mother caused the family physician, to whom she took the child immediately after the injury, to conclude that nothing had penetrated into the interior of the globe; that, in short, the piece of cap, which the mother observed, had simply wounded the cornea, and had fallen out when the lids were opened. The eye was speedily lost, but without any very severe suffering, if the mother gives a correct version. From that time, until very recently, the blind eye caused no inconvenience whatever. In November, 1894, however, the good eye began to exhibit symptoms of sympathetic irritability, which symptoms increased in severity until March, 1895, when the patient consulted me with reference to her case. Upon examination I found vision in the right eye normal, tension normal, and no evidence of inflammation of the iris, or deeper structures, though the organ was very irritable. The injured eye was absolutely blind, tension subnormal, globe somewhat atrophied, cornea staphylomatous and exhibiting yellowish plaques in certain local-

ities. The iris seemed to be applied to the membrane of Descemet. Believing that an attack of sympathetic irido-cyclitis was imminent, I advised the speedy removal of the blind eye. On March 27 the latter was enucleated. The following day I opened the removed organ in the presence of Assistant Surgeon W. F. Lippitt, U. S. A., and found near the periphery of the iris, in the equatorial plane of the globe, a piece of iron, or steel, about 3 *mm.* in length and about 1 *mm.* in thickness wedged in between the iris and lens, and surrounded by a deeply pigmented capsule of iris tissue and inflammatory exudate. The iris throughout the rest of its extent was atrophied, and firmly attached to the membrane of Descemet, the anterior chamber being thus obliterated. The lens was cataractous, being of the color and consistence of cheese, and was pushed forwards toward the anterior pole of the eye. The vitreous was of the same color, and semi-solid. The choroid, ciliary processes, and retina, were thoroughly atrophied. As before mentioned, the foreign body was a fragment of iron, or steel, and not a piece of cap. It must have been a splinter from the hammer, with which the caps were exploded, or a fragment from the piece of iron upon which they were placed. This splinter had evidently passed through the cornea and iris, and had been entangled in the posterior portion of the iris, where it had remained for *seventeen years*. The eye had been lost by an irido-cyclitis, and not by a panophthalmitis. Although cases are on record in which foreign bodies have remained in the eyes for many years without causing sympathetic trouble in the fellow organs, yet those in which a fragment of oxidizable metal has been embedded in such an intolerant tissue as that of the iris of an eye, lost through a traumatic irido-cyclitis, for the length of time involved in the present instance, must be *unusual*, to say the least. This consideration induces me to place this case upon record. Since the removal of the offending eye, in the case just reported, all irritability of the sound organ has entirely disappeared.

A CASE OF MEMBRANA PUPILLARIS PERSEVERANS IN BOTH EYES IN AN ADULT.

Recently the writer examined the eyes of Joseph Macho, 47 years of age, of Fort Leavenworth, Kan., and found in each eye a *persistent pupillary membrane*. This condition was more marked in the right eye than in the left, though very evident in the latter.

Vision in the right eye was very defective, being only $\frac{20}{200}$, examination with the ophthalmoscope revealing cloudiness of the vitreous body, and the presence of several large floating membranous opacities in the same, to which cause the poor vision should undoubtedly be accredited. Vision in the left eye was nearly normal, being $\frac{20}{20}$. The ophthalmoscope revealed nothing abnormal in this eye, beyond the pupillary membrane. The accompanying illustration, from a photograph taken in my presence, gives a representation of the appearance of the "membrane" in the case of the *right eye*. The left eye presented a very similar appearance. The fibers constituting the so-called membrane were not attached to the cornea or lens, though upon casual examination they presented an appearance very similar to that



usually observed in the case of anterior synechiæ. By oblique examination and the ophthalmoscope their true character could be easily determined. Under the influence of a mydriatic the pupils were dilatable, and perfectly regular in outline. In the illustration the outer margin of the pupil, and the fibers of the membrane in this situation, are obscured by the light reflex from the cornea. The fibers constituting the membrane pass over the outer margin, and the outer portions of the upper and lower borders of the pupil, and are united within the area of the latter in a kind of membranous expansion. Only the inner and central portions of the pupil are shown in the illustration, the membrane and light reflex obscuring the remainder.

ABSTRACTS FROM AMERICAN AND ENGLISH OPHTHALMIC JOURNALS.

BY CHARLES H. MAY, M. D.,
OF NEW YORK.

THE PARALLAX TEST FOR HETEROPHORIA.

Dr. Alex. Duane, New York, (*Archives of Ophthalmology*, April, 1895). Eight years' use of this test, upon a large number of patients, has convinced Dr. Duane of its utility, and he recommends it as almost universally applicable, precise and accurate. The method of using the test is as follows:

"The patient is placed in the primary position with head erect and eyes directed straight forward or slightly below the horizontal plane (this latter especially in making the test for near points). The object of fixation, which should be twenty feet distant, may be a candle-flame, but preferably is a white spot 1 to 2 *cm.* in diameter, upon a dull black surface of some considerable extent. By this arrangement all danger of projecting the image upon a surface beyond is done away with, and the chance of a confusion with surrounding objects is prevented. The patient's gaze being directly fixed at the spot, a card is placed before one eye and passed alternately from that to the other, the patient being at the same time asked whether the spot appears to move, and, if so, in what direction. If it remains perfectly stationary there can have been no deviation behind the card, and the position of fixation of both eyes is perfect. If, however, the spot moves, it must occupy a different position as seen by the two eyes; *i. e.*, there is really a diplopia present which our method of observation has unmasked. Thus, if on uncovering the left eye; the object (which was previously seen by the right eye and is now seen by the left) appears to move to the patient's left, there is really a homonymous

diplopia (homonymous parallax) which differs from ordinary diplopia only in the fact that the two images are seen alternately instead of at the same time; if the object seems to move to the right there is crossed diplopia (crossed parallax); if the object moves down, the eye must have been higher behind the screen (left hyperphoria, left parallax); if the object moves up, the left eye must have been lower behind the screen (right hyperphoria, right parallax). In order to determine the amount of this alternate diplopia we place prisms of the appropriate direction and strength before one eye until the movement is abolished. Thus, supposing that when the left eye was uncovered the object seemed to move down and to the left (homonymous and left parallax, indicating a condition of hyperesophoria), two prisms are placed before this eye with their bases respectively, down and out, and increased in strength until the movement has become *nil*. The strength of the prism having its base down will measure the degree of hyperphoria, and that of the prism having its base out will indicate the degree of esophoria present. For near points the test is made in the same way, a small dot on a rather large card being employed, and the movement of the dot upon the card (and not of the card itself projected against some distant object) being observed."

Regarding precision, he states that a prism of $\frac{1}{2}^{\circ}$ is sufficient to neutralize or to produce a decided lateral parallax; "and a vertical movement corrected by a prism of even $\frac{1}{8}^{\circ}$ is clearly noticeable. This precision makes it useful in determining whether a glass that the patient is wearing has or has not a prismatic element, and whether it is centered or not. If, for instance, a patient who has no hyperphoria, shows, with his glass on, a vertical parallax, it proves either that the glass has a prismatic element in it or is faultily adjusted (decentered) so as to produce a prismatic effect."

In regard to accuracy, he claims it is one of the most reliable of all the different methods and that it is sometimes preferable to other methods. In all the other methods in which prisms are used either in trial frames or in phorometers, the patient often unconsciously tries to bring the two images in line and thus conceals a certain amount of the insufficiency which exists. Even when the images are made to appear different (Maddox rod and Steven's spherical lens with small aperture), the impulse towards bringing the two dissimilar images into line is still present. In the parallax test the two images being seen alternately, there is not the same impulse to force them together.

EPHEDRIN—HOMATROPIN, THE NEW MYDRIATIC. A REVIEW
OF THE WORK OF DR. GROËNOUW AND DR. GEPPERT.

George F. Suker, M. D., Toledo, Ohio, (*New York Medical Journal*, June 8, 1895). The writer speaks very highly of this combination and considers it an ideal mydriatic for diagnostic purposes. It has been extensively used in the following form:

Ephedrin hydrochlor.....	1.00
Homatropin hydrochlor.....	0.01
Aq. destill.....	10.00

This forms a clear, colorless solution, the instillation of which produces no irritation or only a slight smarting. It does not influence accommodation. The mydriatic action is rapid and powerful. After a single instillation the pupil begins to dilate in about eight minutes and attains a maximum in half an hour. After an hour the pupil begins to contract slowly and regains its normal size in from four to six hours; when dilated to the maximum, the pupil measures from 5 to 6 mm. This combined solution does not deteriorate as rapidly as homatropin, showing no signs of loss of action after three months. From his observation he concludes that "we possess in the ephedrin-homatropin solution practically an ideal mydriatic for diagnostic purposes, being rapid in its action, sufficiently intense, and of very short duration. Merck prepares this solution under the name of 'mydrin.'"

CLINICAL AND ANATOMICAL STUDY OF SEROUS OR SIMPLE
CYSTS OF THE CONJUNCTIVA.

Dr. G. Rombolotti, Pavia, (*Annales d'Oculistique*, English Edition, March, 1895). The writer makes the following division of serous or simple cysts of the conjunctiva:

"A *first variety* is composed of those which are situated on the bulbar conjunctiva, and which are of congenital as well as of spontaneous origin. Saemisch says that these cysts are generally situated near the corneal margin; that usually they are not movable under the mucous membrane, which latter enters into the composition of their walls. They are round in form, with a thin, delicate wall of almost perfect transparency, allowing the contents, clear as water, to be seen.

"A *second variety* which has its seat on the bulbar conjunctiva near the corneal margin, and with almost the same morphological characteristics as those of the first variety, is composed of those which may be traced to a traumatic origin.

"*A third variety* of sub-conjunctival cysts includes those which are developed in the bulbar conjunctiva from dilatation of the lymphatic vessels of the mucous membrane. They are generally small like a small transparent worm, or disposed in groups.

"*A fourth variety* of cysts which deserves special classification is formed of those which are developed in the reflected portion of the conjunctiva; * * * it appears that their development is due to a cystic dilatation of the acino-tubular glands of Krause."

DIABETIC RETINITIS.

Oscar Dodd, M. D., Chicago, (*Archives of Ophthalmology*, April, 1895). The writer calls attention to the fact that "although the existence of diabetic retinitis has been known for a long time, the literature on the subject is very meager and unsatisfactory." He has tabulated the histories of forty-seven cases, all the cases of pure diabetic retinitis reported in literature, and from the study of these he has collected characteristics indicative of the disease. He mentions the authors who made the most important contributions to the subject and then considers the ideas of different writers.

"The *age* at which diabetic retinitis occurs is generally an advanced one, most of the cases occurring after 45."

The writer mentions several *types* of retinal changes, considering that form the most frequent in which there are "small glistening spots of degeneration interspersed with minute hemorrhages principally in the central part of the retina." These spots are small, rarely exceeding $\frac{1}{4}$ to $\frac{1}{2}$ the size of the optic disc, vary in shape, being usually nodular and irregular, and seldom stellate around the macula as in albuminuric retinitis; in color they vary from a dull to a glistening white or yellowish-white. In a second class of cases, the whitish patches and hemorrhages are scattered over the whole fundus.

"Edema and *active changes* in the retina and optic nerve are rarely present although occurring so frequently in albuminuric retinitis. The vessels are usually of normal size and contour. This is one of the chief distinguishing features between diabetic and albuminuric retinitis."

"The frequency of opacities and hemorrhages in the vitreous has not proved so great as would be supposed from literature, several authors mentioning it as a characteristic of the disease. It was present only seven times among the forty-seven cases reported."

"The *subjective symptoms* of this disease are very slight in the cases with minute hemorrhages and punctate spots in the center of the retina. The retinitis may be accompanied or preceded by the diabetic amblyopia, which, according to Bouchardot is present in one-fifth of all diabetic cases, and frequently occurs without any fundus change. Most of the cases complain only of a dimness of vision, especially for near work, and are seen only upon their applying for glasses to correct the defect. There may also be a sensitiveness of the eyes to light and a flickering before the eyes at an early stage of the trouble, due to an irritation of the retina. When the change affects the macula itself or there are large hemorrhages into the vitreous, the visual disturbance is profound.

"Of the *conditions following diabetic retinitis* the most frequent is atrophy of the optic nerve."

Concerning the *pathology* of the ocular changes he gives a report of the few examinations which have been made and then says: "We see from these cases that the important changes are in the blood vessels. These affect principally the small vessels, and are not so extensive as in albuminuric retinitis. The partial closure of the vessels tends to rupture, producing the small hemorrhages which are so common in this disease, and predominate over the degeneration which is the characteristic change in albuminuric retinitis. If there is anything in the pathology of the disease distinguishing it from other forms of retinitis it is the peculiar changes taking place in the small arteries and capillaries. In other forms of retinitis we have changes in the blood vessels, but they are equally as great or predominate in the large vessels."

In discussing the *differential diagnosis*, which is one of the principal objects of the paper, he gives the table prepared by Badal:

DIABETIC RETINITIS.

1. Marked tendency to atrophy of the optic nerve.
2. Multiple hemorrhages, round and disseminated.
3. Alterations diffuse.
4. Apoplexies do not last to a late stage.
5. Small disseminated spots with some exudate.
6. Color sense, *nil*.

ALBUMINURIC RETINITIS.

1. Less tendency to atrophy which occurs especially at a late stage.
2. Hemorrhages equally multiple, but elongated, and occupy especially the posterior layers.
3. Affect principally the circum-papillary and macular regions.
4. Last throughout life.
5. Whitish fatty spots with infiltrations.
6. Persists a long time.

From a study of the collection of cases, Dodd tabulates the distinguishing features as follows:

DIABETIC RETINITIS.

1. Groups of bright glancing spots in retina, irregular in outline, usually in central part, but frequently affecting whole of fundus.
2. If the spots are larger there still exist small dots and lines, and they never run together.
3. Arteries and veins not much changed in appearance.
4. Optic nerve either not affected or atrophic.
5. Retina not diffusely affected.

ALBUMINURIC RETINITIS.

1. At first a group of bright bluish-white spots in center of retina, often forming stellate patch about the macula.
2. Spots may run together and involve all of central part of retina.
3. Arteries narrowed, veins large and irregular.
4. Optic nerve swollen, and outline indistinct.
5. Retina infiltrated.

DISEASES OF THE EYE DEPENDENT ON THE GRIP.

Thomas R. Pooley, M. D., New York, (*Am. Medico-Surg. Bulletin* report of the March meeting of the New York Academy of Medicine, April 15, 1895, and *Amer. Journal of Ophthalm.*, May, 1895). After mentioning the many diseases of the eye which have been attributed to the grip by various authors, the writer says: "After a careful review of this subject, I would state the following as my conclusions: (1) That eye affections following the grip are comparatively rare. (2) That many of the cases reported as being due to grip are fanciful, and need more substantial proof. (3) Grip may affect the eye by a direct inflammatory process, or by extension from the accessory sinuses. (4) It may affect the nerves of the eye. (5) It is especially liable to affect the conjunctiva, the uveal tract, and the tissues of the orbit, and, perhaps, the fibrous capsule. (6) In some of these cases the extension is by metastasis and in others by direct continuity. (7) Before attributing any eye complication to the grip, careful and thorough scrutiny is necessary to exclude other causes, such as syphilis, alcohol, etc.

A NEW OPERATION FOR PTOSIS.

Dr. Mules, London, (Report of the May meeting of the Ophthalmological Society, *The Lancet*, May 11, 1895). Dr. Mules brought before the society a new operation for ptosis. It was first described by him at the last international Congress of Ophthalmology at Edinburgh in August, 1894. He now gave the results of his

further experience of its effect. The principle of the operation was to substitute the frontalis muscle for the levator palpebræ by extending the former muscle to the margin of the lid by a permanent wire suture. Two needles with eyes near their points were passed deeply through the frontalis tendon over the eyebrow, and their points brought out at the margin of the lid behind the lashes, taking up a substantial part of the tarsal cartilage on their way. A piece of silver wire was threaded through each needle, which was then withdrawn, leaving the loop of wire passing from the brow to the edge of the lid and back to the brow again. This was then tightened until the lid was sufficiently raised, the edge of the lid being slightly grooved by an incision to allow the wire to sink into the substance of the lid. One end of the wire was then passed under the skin and made to emerge by the side of the other end of the wire. The two ends of the wire were then twisted in each other until the lid was wired permanently, the ends cut off, and the wire allowed to sink below the level of the skin. The skin at this point and at the lid margin healed over the wire, which remained permanently fixed in the substance of the lid. From further experience it was found that the wire remained in position without causing irritation; the lids could be closed and remain closed during sleep. All kinds of wire had been tried, but it had been found that silver wire was the most satisfactory. It was necessary to note at the time of the operation the situation of the twisted end of the wire in case it became necessary to remove the suture afterwards.

INTERSTITIAL KERATITIS AND SYNOVITIS WITH A REPORT OF
A CASE IN WHICH BOTH WERE UNILATERAL.

G. Crawford Thomson, M. D., Durham (*The Lancet*, April 13, 1895). The writer reviews the literature of this subject and shows that credit is due to Foerster, who in 1877, "first observed the close clinical connection between the two diseases, and for having first pointed out the non-rheumatic character of the joint disease." He then describes in detail a case in which "both affections remained unilateral" a rare exception to the law formulated by Hutchinson that "interstitial keratitis in its typical form is always in the end symmetrical." * * * "As to the causation of both affections, I do not feel justified in attributing them to inherited syphilis simply for the fact that interstitial keratitis existed together with knee-joint affection. The history of my case, complete as it is, contains scarcely anything to suggest syphilis."

"Complete recovery took place under a simple tonic treatment, neither mercury nor iodid being given. In a disease with a decided tendency to recovery, this latter fact is not of much value; still it in some respects corroborates the view taken here."

The writer argues against the exclusively specific nature of interstitial keratitis, doubting the correctness of the rule laid down by Hutchinson: "Interstitial keratitis in its typical form is always a consequence of syphilis and in itself sufficient for the diagnosis." The results of most other ophthalmologists, as shown by a recent table of Ogilvie, do not bear out Hutchinson's rule. "Another argument against the exclusively specific nature of interstitial keratitis given by Ogilvie is that it has been observed in dogs, and experimentally produced in rabbits. Since the publication of his paper several cases of interstitial keratitis have been observed in bears by Hennicke, and the diagnosis has been confirmed by microscopical examination."

"According to Fournier four theories exist concerning the causation of interstitial keratitis: (1) That it is a cachectic malady—'une manifestation de la misère organique' (Panas); (2) that it is produced by scrophulous or strumous disease (W. Mackenzie); (3) that it is exclusively, or nearly exclusively, due to syphilis (Hutchinson); and (4) that it is a lesion of natural nutrition (Fournier). He dismisses (2) with little comment as no connection with strumous disease could ever be proved; he considers (3) to be contrary to the clinical facts as interstitial keratitis is met with apart from any specific influence; and refutes (1) because interstitial keratitis is met with in subjects otherwise apparently healthy, and in private as well as in hospital practice. I fail to see that Fournier's explanation differs materially from that of Panas." A lesion of general nutrition, "cachexia" and "organic misery" are only different expressions for the same condition, or for different degrees of the same condition. Therefore, the fact that interstitial keratitis is met with in apparently healthy subjects is explicable by either theory only in one and the same way, *viz*: that the defective general condition in these cases is apparent as localized or limited to one special organ. This same view has been quite recently taken by Panas who admits that between Fournier's dycrasia and his cachexia practically no difference exists, and that he therefore willingly accepts Fournier's denomination instead of his. From the above the conclusion has to be drawn that in the production of interstitial keratitis hereditary syphilis is probably operative in between 60 and 70 per cent.

"I, therefore, from my own case, as well as from the experience of Arlt and Lavergne, draw the following conclusions: Neither interstitial keratitis nor the synovitis nor their coexistence is itself absolute proof of hereditary syphilis; that the joint disease also is due a general defect of nutrition, in the production of which inherited syphilis plays a prominent part, the extent of which we are not able to give in figures. In what this disturbance of general nutrition consists, what general condition constitutes the connecting link between interstitial keratitis and synovitis, is merely a matter of conjecture."

A NEW APPLICATION OF THE KERATOMETER OF JAVAL.

Dr. W. F. Southard, San Francisco, Cal., (*Medical Record*, April 6, 1895). Dr. Southard calls attention to the fact that Javal's ophthalmometer may be used to obtain an excellent view of the cornea and iris. "Seating my patient before this instrument and lighting but one of the lamps, the light was made to fall directly upon the cornea. After a little maneuvering with the telescope a fairly good view of the iris was obtained. As soon as the iris came into the field the reflexes of the disc appeared. Further experimenting brought out the fact that to see these surfaces distinctly it was necessary to take the illumination from a little back and to the same side as the eye to be examined, then focus the light upon the eye with a mirror of eleven-inch focus. I used a gas flame for illumination, and my head-mirror which I held in my hand. The details of the cornea, if opacities are present are very distinctly seen; the color of the iris, its structures, the crypts, contraction furrows, pigment patches, and papillary zone are all clearly brought out. Opacities on the anterior surface of the lens may be seen. The image thus obtained is magnified and all the details easily made out, such as tumors or synechiæ. By mounting the mirror on a stand both hands are free to make a sketch of the actual situation of adhesions. While we are measuring the curvature of the cornea it takes but a moment to carry out this examination should it be thought best to examine the iris. If the patient will look through the opening in the disc, thus relaxing the accommodation, the pupil will dilate and uncover any adhesions of iris should they be present. A slight disadvantage in examination by this method is due to double images of the large disc and wires. By revolving the tube, the image caused by the prism which lies just outside the optic axis of the tube will be carried around the stationary image, thus all portions of the iris will be seen in turn.

PECULIAR PERVERSION OF THE COLOR PERCEPTION.

Homer E. Smith, M. D., Norwich, N. Y., (*Medical Record*, March 9, 1895). Dr. Smith reports the case of a boy of 11 years of age in whom among other evidences of functional disturbances referable to the nervous system there was a peculiar perversion of the color perception. The following is the portion of the report which relates to the eyes: "Vision, O. D. = $\frac{4}{20}$; O. S. = $\frac{8}{20}$. There is no strabismus or conjugate deviation of the eyes. Motion perfect in all directions. Pupils equal and of normal size, contract to light exposure, consensually, to convergence, and to peripheral excitation of the retina (Wernicke's test). Fields, marked peripheral limitation, greater in right. No scotomata. Accommodation not impaired. Selects colors correctly as to shade, but each appears in its complementary, *i. e.*, red is called green, and green appears as red. Blue looks like yellow, and yellow, blue. White appears brown. Has micropsia and metamorphopsia. There is moderate photophobia present. Has in each eye monocular polyopia. The ophthalmoscope shows O. D. diffuse neuro-retinitis. The bulk of the trouble is in the retina, which is edematous and opaque. The papilla is not swollen, but is markedly congested with a nearly complete obscuration of the choroidal ring. Veins slightly tortuous, no hemorrhages. O. S. same condition, lesser degree." The child was given iodid of potassium and tonics, and after four weeks all these symptoms had disappeared. The writer thinks that most likely the lesion was an intra-cerebral effusion, probably hemorrhagic, situated in the left optic thalamus with pressure effects involving the internal capsule in the thalamo-lenticular division. (Dr. Smith sent a number of reprints to various prominent oculists of the United States inviting an opinion regarding the diagnosis in this case. A number of different views were expressed in the answers which he received; most of them regarded the case as an example of hysteria. C. H. M.)

BLOOD-STAINING OF THE CORNEA.

Mr. Treacher Collins, London, (Report of the May meeting of the Ophthalmological Society, *The Lancet*, May 11, 1895). Mr. Collins found that this staining of the cornea, which was of a greenish or reddish-brown color, was due to the presence of a number of highly refracting granules scattered throughout its substance. These granules are not located with any definite relation

between laminæ of the fibrous tissue; they agreed in their spectroscopical appearances and chemical reactions with hematoidin. He found that in some of the cases associated with granules of hematoidin there was a substance which gave iron reaction with ammonium sulphid, and which was probably hemosiderin. In eyes in which this discoloration occurred the tension was generally increased, the exit of fluid through the angle of the anterior chamber being obstructed by the accumulation of blood clots. He was of opinion that at first hemoglobin passed into the cornea from the anterior chamber through Descemet's membrane, and that the hematoidin, which is insoluble in the fluids of the cornea, was then precipitated there. The whole of the cornea was at first affected, and when this was the case the condition could not be distinguished from that in which blood-clots completely filled the anterior chamber. The absorption of the hematoidin granules commenced at the periphery equally in all directions, so that by degrees a narrow ring of clear cornea appeared around the stained area. The appearances then presented were strikingly similar to those of a lens dislocated into the anterior chamber. The absorption of granules becomes slower and slower the further they are removed from the sclero-corneal margin. He had seen one case in which the discoloration had completely disappeared in the course of about two years.

ABSTRACTS FROM FOREIGN OPHTHALMIC JOURNALS.

BY CASEY A. WOOD, M. D.,
OF CHICAGO.

VARIATIONS IN THE PUPIL ACCOMPANYING PULMONARY TUBERCULOSIS—THE OPERATIVE TREATMENT OF HIGH DEGREES OF MYOPIA—MYOMA OF THE CHOROID—THE VOSSIUS METHOD IN CATARACT EXTRACTION—REPAIR OF A LARGE RUPTURE OF THE ANTERIOR LENS CAPSULE WITHOUT THE FORMATION OF CATARACT—GLAND-LIKE BODIES BENEATH THE ANTERIOR CENTICULAR CATARACT.

VARIATIONS IN THE PUPIL ACCOMPANYING PULMONARY TUBERCULOSIS.

In this article Rampoldi¹ reviews the opinions of several writers on the subject and publishes his own experience. At the last International Medical Congress Destrée² read a paper in which he claimed that in 97% of cases of tubercular phthisis he observed an unequal dilatation of the pupils dependent upon irritation of the sympathetic plexus at the hilus of the lung from disease in the bronchial glands. This sign, he claims, often precedes the invasion of the lung tissue and is a sure indication of tuberculosis of the bronchial glands. Cardarelli draws attention to the fact that the tubercular character of swelling in the peribronchial glands has been recognized since the earliest times, and that these glands, like the mesenteric, may retain the bacillus tuberculosis in a state of latency. Destrée later affirmed that after long continued and daily study of these cases he was able to state positively that the pupillary condition is the result of swelling of the peribronchial glands,

¹ R. Rampoldi: Ancora sulle variazioni pupillari dipendenti da malattie polmonari di natura tubercolare. *Annali di Ottalmologia*, Anno XXIII., Fasc. 6.

² Un segno premonitorio della tubercolosi polmonare. *Riforma Medica*, Anno X., No. 79.

which, pressing upon the filaments of the sympathetic, brings about the dilatation referred to, and that he had confirmed the fact of the pressure upon the nerve by many autopsies. Moreover, recent researches have proved that the peribronchial glands are usually infected very early in the disease, probably the first tissue invaded, and if we could be put into possession of a sign that would indicate that invasion, it is easily understood how important it would be from the standpoint both of diagnosis and treatment.

Rampoldi shows that he was the first (in 1885) to draw attention to this sign of pulmonary disease. Later (in 1886) he published a case which seemed to confirm the experience of Oehl "that it is possible to transmit a primary excitation of the vagus to the pupil by way of that sympathetic branch which runs from the superior cervical ganglion to the vagus itself."

In addition to this sign the author believes the following history to furnish evidence of further implication of the ocular nerve supply by tubercular disease of the lungs:

R. A., domestic, 16 years of age, seems in good health, but has suffered for three years with a slight cough, thought to be bronchitic. She visited the klinik on account of a *falling of the right upper lid* that had lasted the previous fortnight. A careful examination of the eyes was made and it was found that the patient had a decided ptosis on the right side, accompanied by a marked contraction of the corresponding pupil, which was sluggish to light and accommodation—in other words an unequal *dilatation* of the *two* pupils. There was no trace of posterior synechiæ, and no refractive error. Vision was normal both for distance and near.

Chiefly on account of the irregular innervation of the iris and *lavator palpebræ superioris* (not otherwise explained), Rampoldi suspected pulmonary disease and sent the patient to the medical klinik. She was found to have tuberculosis of the right apex.

THE OPERATIVE TREATMENT OF HIGH DEGREES OF MYOPIA.

This is an interesting paper contributed by Prof. Vossius³, who describes very graphically the plague that threatens not only his own but other countries—that of shortsightedness. Not only is myopia on the increase, but it spares no class and no age, and we are without effective means of putting a stop to its onward march.

³A. Vossius: Ueber die operative Behandlung der Myopie nebst Bemerkungen ueber die Staroperation. *Beitraege zur Augenheilkunde*, XVIII. Heft. p. 49.

Owing to a diminution in the apparent size of distant objects seen through them, lenses which fully correct the refractive error do not give much relief, in the higher degrees of shortsightedness especially. Such patients content themselves either with a partial correction, which helps them very little, or they do not wear glasses at all—with the idea of conserving their sight—and thus remain practically blind so far as the outside world is concerned.

Many are the devices that have from time to time been tried with the purpose of radically removing the curse, the short sight. Purkinje, who suffered from a medium degree of myopia, was in the habit of placing on his eyes, over night, a small bag filled with half a pound of iron filings, and felt rewarded when he was able to read the numbers on the houses across the street next morning! Yet he did not succeed either in curing or lessening the amount of his refractive error.

The operative treatment is the only one to which we can look with any confidence for the permanent relief of the more distressing forms of myopia. Velpeau, in consequence of the belief that shortsightedness is the result of pressure upon the globe exerted by the external ocular muscles, advised section of certain of the latter. But this proceeding, as well as the plan of Galezowski (the removal of a crescentic portion of the cornea), soon fell into disuse.

In recent years removal of the lens has been more successful in lessening the amount of high degrees of myopia, in increasing the visual acuity, in improving the working capacity and in diminishing the ever present danger of further inroads on the part of the disease.

The first mention of treating excessive myopia by aphakia appears in Beer's book, edition of 1817. The suggestion was not acted upon until 1858, when Mooren brought the matter to the notice of the Heidelberg Congress.

Donders objected to the operation on account of the loss of accommodation and because he could not see how the fundus changes could be improved thereby.

In 1887, Fukala first presented his paper, with a report of two cases successfully operated upon, before the Vienna Medical Society, and since that time has frequently presented the claims of a method with which his name is very properly linked.

The following is a summary of Fukala's conclusions regarding this important matter:

1. The amount of myopia present before the operation determines, of course, the refractive state after removal of the lens. In any event the effect seems to be greater than that which we are accustomed to look for after extraction of senile cataract. In the latter case we usually find a 10 D. glass necessary to replace the cataractous lens, but Fukala found the optical value of an extraction in high myopia to vary from 12.75 to 20 D. This he thought to be due to the abnormal shape (and consequent effect) of the myopic lens upon the refraction.

2. The central visual acuity improves greatly as a result of the operation, and thus improvement may amount to four, five and even ten times the original.

3. The marked convergence of the visual axes and the abnormal bending of the head in near fixation are relieved—an important consideration in progressive myopia. When the myope, as the result of an operation, becomes a hypermetrope or an emmetrope, he must, of course, wear the glasses necessary to enable him to read at a desired distance. In this case the retinal images become measurably larger.

4. There is, of course, a loss of accommodative power [In his earliest paper Fukala claimed that some patients still retain a certain amount of accommodation after removal of the lens. C. A. W.] following operation, but this is not without its advantages since accommodative efforts are undoubtedly a frequent cause of the increase in the myopia.

5. When both eyes are affected by myopia of high degree, but unequally, it often happens, in consequence of the impossibility of binocular vision, that a divergent strabismus results. This often disappears after the operation.

It is in such cases, and indeed in most instances where binocular vision for either distance or near is absent (owing to the high degree of the myopia) that Fukala thinks the most useful results are obtained.

Fukala considers the following to be the indications for the operation: the absence of chorio-retinitis; adults having at least 14 or 15 D. of myopia; children under 10 years of age as soon as the myopia has reached 10 D., as these patients will, in all probability, acquire a higher degree later in life. In myopes of 17 D. one eye *may* be operated upon, although the removal of *both* lenses in such cases is indicated; in those of 18 D. and over in each eye the bilateral operation is always to be preferred—in the hope of recovering the lost binocular vision.

The operation consists, according to Fukala, of a simple discission with the needle, and at first he was in the habit of doing a small iridectomy. Other operators have dealt with the lens in various ways, removal by a linear incision, thorough discission and subsequent removal through a corneal, splitting the lens with a Graefe knife, etc.

If very little or no reaction occurred, or if the lens did not soon become opaque, Fukala again "stirred up" the lens substance as at first. This was repeated as often as needed until the lenticular body was well forward in the anterior chamber. The eye was quieted by atropia and cold applications. As a rule the lens was allowed to undergo gradual absorption, but if increased tension, pain or ciliary injection showed itself, the cornea was punctured with a lance-shaped needle and as much lens matter as possible removed. The best visual results are not to be expected inside of three or four months. Fukala has mostly operated upon young subjects, and has never seen any bad results follow his operations. He has always found that the myopia does not increase and the fundus picture does not change.

Vossius gives a short history of nine cases upon whom he operated. These were chiefly those whom glasses did not help and who were practically unable to do near work of any useful kind. The results were in most cases good. The myopia was decidedly lessened and the visual acuity greatly improved. The author found a remarkable difference in the results as regards the former condition; the refraction decreased from 13 D. in the lowest instance to 28.5 D. in the highest. The case of the latter is worth a brief mention: A student, 20 years of age, has a well marked progressive myopia. There is a strabismus *convergens*, with diminished ocular excursion in all directions. Media clear, albinotic fundi, temporal conus and no macular changes. Under cocain discission of the right anterior capsule followed by considerable swelling of the lens.

Six days afterwards a linear extraction with a Beer's knife. There was a slight anterior synechia, but the corneal wound entirely healed and the eye became quiet. There is a round pupil.

Before the operations O. D. had 30 D. of M., and V. = $\frac{20}{100}$; O. S. had 25 D. of M., and V. = $\frac{30}{80}$; after the extraction on the right side V. R. = $\frac{30}{80}$, and *the refraction is now only — 1.5 D.* The patient can now read small print at the normal distance with-

out a glass, can distinguish people across the street, and declares that his perception of color is greatly improved, and is much pleased with the result.

The effect upon the refraction of the patient's right eye by this operation was certainly remarkable and unusual. The author points out the fact that skiascopy was used, in addition to the subjective tests, in all the cases as a control experiment, and that no mistake might be made in determining the exact refractive condition. He explains the loss of 28.5 D. of M. by the peculiar appearance of the lens; it was almost round like that of the new born infant, and was in all probability moulded into that shape by long-continued spasm of accommodation.

In dealing with the lens in these nine cases of myopia only two were allowed to undergo spontaneous absorption after repeated needlings. In the others, and especially in those instances where there were signs of irritation following the preliminary discission, the lens was removed *en masse* through a peripheral linear incision. It was found necessary to make repeated punctures of the cornea when portions of the lens remained.

Preliminary cutting through the whole mass of the lens has a very different effect in different cases. Its chief drawback is that it tends to bring about prolapse of the vitreous, and to make it necessary to repeatedly puncture the cornea for the purpose of expelling portions of the lens.

Simple linear extraction is, however, usually effective in removing all the lens matter required in these cases of excessive myopia. It is absolutely safe when strict antiseptic and aseptic precautions are taken, and infection of the wound or loss of an eye is a very rare accident.

MYOMA OF THE CHOROID.

Analogous reasoning would lead us to suppose that myoma of the choroid and ciliary body should be comparatively common. Like the uterus, the interior of the eye is well supplied with the material for the growth of muscular tumors, but nevertheless, ocular myomata are very rare. Guaita, who has looked the matter up finds that in addition to his own case only two others have been published. One of these, however, is widely known from its publication in the *Traite complet* of deWecker and Landolt.

The microscopical appearances of the tumor sections are reproduced in ten micro-photographs that appear to be quite as successful as such pictures commonly are, but so far photography has not

reached that point where, for purposes of illustration, it can successfully compete with metal engraving or even with careful photolithography.

The history of the case⁴ is as follows: C. A., 20 years of age, mechanic. Father died of pulmonary tuberculosis; mother alive and healthy. One sister healthy, but four brothers died young. Although not very strong he has a sound constitution, and does not present any organic lesion.

Nine months ago he was first conscious of a slight cloud before the right eye, but this symptom was unaccompanied by pain or irritation. During the past two months in looking at an object with his right eye alone he found that above and below the horizon he could distinguish it fairly well, but towards the center there was quite a large horizontal area in which vision seemed more or less confused, as if he were looking through a cloud. During the past fortnight vision in this region has been entirely abolished, the visual defect gradually shading off until perfect sight is obtained above and below. During this time he has never had any pain except one night, about a month before, when he suffered a little and there was considerable lachrymation; in the morning the eye had become quiet again.

The right pupil is markedly dilated so that the iris measures only 2 mm. across; it is unaffected by light, but a 1 per cent solution of eserine contracts it. The ocular tension is somewhat augmented, and the deep vessels of the sclera are slightly engorged.

Upon the sclerotic, down and in, and occupying the space between the insertions of the internal and inferior recti muscles 4 mm. from the corneal margin is a rounded elevation 3 mm. in diameter. At this point this tumor shines through the sclera with a reddish-yellow color.

With the upright image the retina is seen to be detached, but is not markedly pushed forward. When the patient looks down a portion of the retina is seen to be adherent. At this spot also there is seen a yellow-red reflex, the background being dotted over with circumscribed spots of black pigment giving to the elevation an ill-defined outline approaching the globular. This corresponds in position to the elevation visible externally, and reaches to the equator of the globe. Some small retinal vessels ramify over the surface of the tumor.

⁴Prof. L. Gualta: Mioma della corioide. Clinica oculistica della Università di Siena. *Annali di Ottalmologia*, Anno XXIV, Fasc. 1, 1895.

The writer, although uncertain as to the diagnosis, suspected either a subretinal cysticercus or a choroidal neoplasm. As he was unable to decide at once he kept the patient under observation, but when, after two weeks' time, and repeated examinations, he was unable to discover any movement in the yellowish-red body, (although he found that it was slowly increasing in size) he fell back upon the diagnosis of tumor of the choroid. This, of course, means sarcoma in the great majority of instances, and the patient having been advised consented to an enucleation which was performed with good results.

The eyeball was thoroughly hardened in Flemming's fluid and after immersion in various graduated mixtures of alcohol was divided into two hemispheres, the section passing through the center of the tumor.

Without entering into a tiresome translation of a very full report given of the microscopical examination it is sufficient to say that the sclera was not involved in the tumor, and that the latter extended from the ora serrata to the equator. It measured 8 *mm.* in its long diameter by five in breadth. Including the choroid it was from $1\frac{1}{2}$ to 2 *mm.* thick. It presented in this way an irregularly elliptic body having its greatest diameter antero-posteriorly. Its external surface was the choroid; its internal the altered retina. The choroid was not especially adherent to the tumor except at certain points.

There can be no doubt but that the mass of the neoplasm is made up of fibro-cellular muscular tissue with its characteristic elongated nuclei. These fibers are mostly longitudinal and unite to form bundles between which may be seen fusiform spaces lined with endothelium which are probably lymph channels.

The tumor contains pigment distributed throughout its mass, but it seems to be less abundant at its external surface where it joins the choroid. The vascular supply of the new growth is rather scant, the vessels found being branches of those normally supplied to the choroid, little, if any, enlarged. The nutrition of the neoplasm seems to have been carried on chiefly through the lymph spaces just described.

The retina mostly presented the changes found in detachment of that coat.

It is the opinion of the author that the mass of the tumor developed from the longitudinal muscular fibers of the choroid. One of the micro-photographs, the most satisfactory of the whole ten, shows very beautifully how these fibro-cellular bands spring

from the choroid, radiate into and form part of the mass of neoplasm. In other parts of the tumor presented to the choroid the new growth appears to be pedunculated upon the surface of the former, an appearance due to its attachment by similar bands of new ingrowing muscular tissue.

THE VOSSIUS METHOD IN CATARACT EXTRACTION.

The writer pins his faith to a method without iridectomy, and gives as a reason for the omission that it is much simpler for the patient and more ideal for the operator. The former suffers less pain and retains his round pupil. The visual result is, however, no better than extraction with iridectomy, while the healing process occupies about the same space of time with both methods. The chief value claimed by Vossius for the simple form of extraction, that he is now in the habit of doing, lies in the position and character of his incision. Instead of confining it, as do most operators, to the clear cornea, he makes a conjunctival flap, thus procuring early closing and smooth healing of the wound, combined with quicker consolidation of the operation scar. All these factors are important in preventing infection of the wound, in forestalling prolapse of the iris and its incarceration between the lips of the incision.

The pupil is dilated *ad max.* by atropin-cocain. Then with a Graefe knife he carries his incision through the limbus cornea so as to include about one-third of its circumference and makes, in cutting its way out, a conjunctival flap 3 or 4 mm. long. Turning over the mucous flap he freely cuts through the anterior capsule with the cystitome, now, holding a repositor in the left hand he presses the iris well back into the periphery of the anterior chamber, and while it is held in this position proceeds in the usual way, by careful pressure upon the lower border of the cornea with a rubber spoon, to coax out the lens. The iris is now replaced, the conjunctival flap fixed in position and made as smooth as possible. After a slight compression of the globe with the cotton wool, a few drops of eserin solution are dropped into the eye and a bandage applied.

A CASE OF REPAIR OF A LARGE RUPTURE OF THE LENS CAPSULE WITHOUT THE FORMATION OF CATARACT.

Liebrecht⁵ gives the following instructive history: A workman came to him with the complaint that he could not see distinctly

⁵ Liebrecht: Ein geheilter Fall von isoliertem grossen Linsenkapselriss ohne Kataractbildung. *Beiträge zur Augenheilkunde*, XVIII. Heft, p. 75.

with his left eye since he had been struck (several hours before) on the outer aspect of the globe by a large piece of iron while hammering.

The conjunctiva at the site of the injury is dotted with small hemorrhages, but there is no wound. The cornea is everywhere smooth and shows an unbroken reflex. The anterior chamber is normal, the iris is not injured and the lens is in its proper position. The anterior capsule is ruptured in an oblique direction—downwards and outwards from above inwards. When the pupil is widely dilated the rupture stretches from one edge of the iris to the other. At the center the rupture is quite 1 *mm.* wide, closing in at either end. At the site of the rupture the lens is slightly cloudy; in other situations transparent. After a few days numerous punctate opacities were discovered in various parts of the lens. The lens capsule lies in folds which have formed at right angles to the rupture, but do not extend to the equator. The ophthalmoscope shows the nerve-head and vessels to be distorted, as in irregular astigmatism.

The progress of the case was as follows: the edges of the wound became more swollen and appeared whiter, but on the other hand, the opacities between them gradually disappeared until a week after the accident they could not be seen even after a careful examination with a lens and a bright illumination. The whitish edges of the wound now approached one another from the pointed extremities of the rupture. With a magnifying glass delicate fibers can be seen running from and along its edges, some of them losing themselves in the depths of the lens. The space between the edges of the rupture continued to be filled in by processes from its sides until in four weeks time the lens opacity could no longer be seen through it. This left a broad, white mass of fibers which faintly marks the old site of the rupture. In the course of time this collection decreased considerably in size and lost its white, glistening appearance, but there remained a fold in the capsule above and below the wound.

Seven months afterwards $V = \frac{1}{18}$, for the near, Sn. III, slowly.

It may with certainty be assumed that repair took place through proliferation of the capsular epithelium at the edge of the rupture. This must have occurred early to have defended the lens matter from destructive attacks of the aqueous humor, and the epithelial layer must have been very thin and transparent. The fibrillar processes and the mass of cells were also propagated from the epithelial tissue of the anterior capsule. Liebrecht made a micro-

scopical examination of the lens and capsule in cases of similar injury to rabbits' eyes and found the same marked proliferation of the capsular epithelium

GLAND-LIKE BODIES BENEATH THE ANTERIOR LENTICULAR CAPSULE.

The writer claims that in the case described in his paper⁶ he was able to distinguish glandular structures in the anterior capsule of the lens.

K. B., 60 years of age, had since childhood suffered from repeated attacks of inflammation in his right eye, and for twenty years has had a large gray opacity in the cornea. His vision is very defective in this eye. Ten years before he suffered an injury in the left eye which produces a temporary and partial blindness. A month ago, probably as the result of exposure to cold while profusely perspiring patient became suddenly blind. A dark cloud appeared before his left eye and he had to be led home.

In the left eye the condition was as follows: Palpebral conjunctiva slightly red and swollen. Arcus senilis, but cornea otherwise normal. Anterior chamber deeper below than above. Pupil an irregular oblique oval reacting promptly to light, and widely dilating (round and regular) under the influence of homatropin.

On the anterior surface of the lens are seen small, guttate bodies of a delicate grayish-white color. These are mostly round, but some of them are oval; others kidney-shaped. With a magnifying lens these appear to be spheroidal bodies, perhaps 0.5 mm. in diameter, but both their shape, size and color vary with the amount and kind of illumination. The surface of these small swellings as well as of the lens capsule elsewhere, reflects a glimmering almost pearly white color. As a rule the small bodies are distinctly separated from one another by normal lens capsule; in other cases they are so closely packed as almost to coalesce. The largest number is found at the anterior pole of the lens, but there are also many to be found at the margin of the dilated pupil. The lens capsule itself is otherwise smooth and transparent.

With reflected light these bodies show as small dark points, and appear smaller than they do under the oblique illumination.

In both the anterior and posterior parts of the lens are slight striae to be seen, but these are mostly peripheral. These are opacities in the vitreous and detachment of the vitreous. V. = fingers at 4 m.

⁶A. Sachsälber: Drusen der vorderen Linsenkapsel. *Deutschmann's Beiträge*, 18 Heft., 1895, p. 660.

An iridectomy was done and the patient further treated with steam baths, rest in bed and pilocarpin injections. This seemed to improve the vision somewhat but the lens changes remained the same.

The writer thinks that the small bodies above described are identical with those described by H. Müller and Otto Becker,⁷ and which are regarded by the former as very like the papillæ of Descemet's membrane or the isolated glands in the vitreous layer of the choroid. That they occupied the space immediately under, and were covered by the capsule itself, is made certain by the behavior of the light reflected from them and the surrounding structures.

⁷ Untersuchungen ueber die Glashäute des Auges, etc. Gesammelte u. hinterlassene Schriften, 1872, I. 254.

REPORTS OF SEVEN INTERESTING EAR CASES.¹

BY D. MILTON GREENE, M. D.,
OF GRAND RAPIDS, MICH.

EYE, EAR, NOSE AND THROAT SURGEON TO BUTTERWORTH HOSPITAL, U. B.
A. HOSPITAL, HOLLAND HOME FOR THE AGED; LECTURER TO
ST. MARK'S AND U. B. A. TRAINING SCHOOL FOR
NURSES; CHAIRMAN SURGICAL SEC.
STATE MED. SOCIETY, ETC.

IN 1892, in a paper read before the Am. Med. Asso., I reported five cases of mastoid suppuration complicating acute suppurative otitis media. Four of the five cases were operated upon and pus found in the cells and antra. All recovered except the one unoperated. In this one an autopsy proved the diagnosis. In none of these cases was there external swelling, redness, edema, or pain over the mastoid, and the diagnosis was made in a manner original with the writer, so far as I know or could learn from anything that had been published up to that time. It had long been my belief that many people had died from meningitis, cerebral abscess, and pyemia, complicating middle-ear disease, whose deaths were attributed to other causes. Both before as well as since that time I have certainly seen death result in several cases from such complications. In the paper referred to I advocated early operation as a safe surgical procedure, and stated that I did not consider the operation, *per se*, dangerous to life, and I am still of the same opinion. Since my paper was published I have received many letters and reprints from prominent otologists indorsing the views expressed therein, and numerous cases are now recorded of a similar nature. Some have even gone farther and advocated opening the mastoid in obstinate cases of chronic suppurative otitis; while

¹ Read before the Michigan State Medical Society.

others advise the operation as a means of diagnosis in acute otitis media, so as to be sure no pus is allowed to remain in the cells undetected. It is not my purpose, however, to discuss the merits or demerits of this operation. Believing that a report of several cases which present points of unusual interest would be the best means of promoting discussion of this important subject, and to get these cases on record is my only excuse for this paper, and if you will bear with me a few moments I will report them in brief.

I wish to say while passing that the statistics bearing upon this subject fully prove the gravity of suppurative middle-ear disease and I will quote briefly from a few of the many. Though a large per cent of cases of acute suppurative otitis media recover under ordinary or even bad treatment, we never know what case may be complicated and prove fatal.

Dr. Clark, of Chicago, reports a case of thrombo-phlebitis of the lateral sinus, jugular and innominate veins with metastatic abscesses in the lungs causing death. There had been no complaint by the patient of ear disease at the time, but an autopsy by Dr. Hektoen revealed mastoid abscess as the cause of the trouble, which condition had not been suspected, but was supposed to have been malarial fever. Any inflammatory process attended with pus formation in such close proximity to the brain, especially in the deep recesses of the skull like the middle ear and the mastoid antrum, should not be regarded lightly, as is too frequently the case. I fear that la grippe is now the pack-horse for bad diagnoses as malaria has been in the past. The doctor is too apt in obscure cases attended with fever to content himself by presuming it to be that unaccountable la grippe.

Dr. B. Alex. Randall's tabulated statistics of 4,785 cases of ear diseases treated in the Philadelphia Polyclinic, of which 3,914 were middle-ear disease, he found

Simple acute.....	223	
Suppurative acute.....	457	
Suppurative chronic.....	918	
Empyema of mastoid.....	11	} 76
Caries of mastoid.....	40	
Caries of tympanum.....	16	
	<hr/> 2,074	

Which shows in 2,074 cases serious conditions in 76 cases, or 3.5%.

Pitt found in 9,000 consecutive autopsies, 158 deaths due to suppurative otitis.

Bezold found in 325 cases of ear disease 1.5% of deaths.

Barker, from London hospitals, in 8,020 consecutive autopsies found 179 deaths from suppurative otitis.

Pierce found, in the University Hospital, London, in 820 cases of acute and chronic otitis media a mortality of 2.5%.

The statistics of mastoid disease and operations published by Dr. Frank Allport, in the *Journal of the Am. Med. Asso.* of 1892 and 1893, tend strongly to prove that death following mastoid operation is due to the condition for which the operation is performed and is not due to the operation itself.

Case I. Mrs. J. H. M., 42 years of age. Was called in consultation with Dr. J. A. DeVore and got the following history: Had always been quite well, but never strong; had earache and some discharge from the left ear two years before, following an attack of la grippe, but soon recovered; was taken with la grippe again about two months ago and left ear became painful, membrana tympani ruptured and pus has been discharging ever since in considerable quantity; has considerable pain by spells; temperature 104.2; has a sense of fulness in left ear and feels dizzy. On examination I found considerable swelling in the auditory canal; one-half of drumhead had ulcerated away; some tenderness on pressure over the mastoid; there was extreme swelling and edema over mastoid; could not hear the voice even in a loud tone; heard tuning fork over mastoid. As all signs and symptoms were present which are regarded as pathognomonic of pus in the cells, I advised operation, which we did, under chloroform. Made a curved incision close to the insertion of the auricle, from the tip of the mastoid to a point above the ear. Commencing immediately behind and on a level with the external auditory meatus, I separated the periosteum and all soft tissues from the back wall of the auditory canal, clear to the bottom of the tympanic cavity. With a hollow chisel and mallet I then exposed the cells and went into the antrum, which was fully $\frac{3}{4}$ inch from the surface, then chiseled through into the tympanum at the bottom. We found cells and antrum full of lymph, but no pus. The next day pus flowed freely from the antrum and cells. She made a rapid recovery, and in a few weeks was coming to my office with a glass drainage tube in the mastoid. In

four months the hole in the drum had healed and hearing was perfect, even better than in the right ear, which was somewhat affected by catarrhal deafness. At no time after the operation did her temperature go to 101 until it was caused by a little abscess at the point of the mastoid; after opening which her temperature remained normal.

This case is of interest as it bears upon a diagnosis of pus in the cells. Pain, swelling, edema, and redness over the mastoid, which have hitherto been our main reliance and guide to a diagnosis of pus in the cells, in this instance utterly failed us, and no pus was found.

Case II. Mr. R. V., 19 years of age, referred to me by Dr. Boot, called with his brother at my office at 1 P. M. Said he had fever a year before—had earache and discharge from the ear for a month or so, when it ceased; had no more trouble until about three weeks ago, when his ear began to discharge; had never suffered pain during the last attack, but had been working every day at wood carving. He said, "this morning when I got up I felt stiff in my jaw, and it was hard for me to open my mouth." On examination, I found temperature 102; pulse 100; pus flowing so fast that it would fill the canal in twenty minutes or less. No granulations obstructed my view, and I could see clearly a swelling from the upper and back of tympanum, which crowded the membrane far forward and downward. There was some swelling of the back wall of the auditory canal, out as far as the beginning of the cartilaginous portion; had no pain or tenderness or swelling over the mastoid, but there was a distinct swelling back of and below the mastoid process, which felt boggy, and was as large as a silver dollar. I sent him to the hospital and had him thoroughly prepared for operation. Under chloroform anesthesia, in presence of several physicians, I incised the soft tissues, as in the case just reported, and with hollow chisel and mallet I opened into a cavity through about $\frac{1}{4}$ inch of solid bone, $\frac{3}{8}$ of an inch back of and on a level with the meatus auditorus externus. A flood of pus filled the wound and ran over the surface, and was followed by a gush of venous blood. My first impression was that I had opened the lateral sinus, but the hemorrhage soon ceased. With the blunt end of my chisel I probed the cavity carefully, but to my surprise could feel no internal bony wall. I dressed the wound with bichlorid gauze. Saw him next morning, temperature 100; pulse 100; felt "well." Carefully irrigated the cavity and ear; there was very little pus. In the

evening I examined the cavity in the mastoid through the opening in the bone (which was $\frac{1}{2}$ inch in diameter) by the aid of a head mirror—there were no mastoid cells—and the inner bony plate was entirely absorbed away, leaving the duramater bare over a surface $\frac{7}{8}$ by 1 inch or more in diameter. The lateral sinus to the extent of an inch or more could be plainly seen, and at a point about midway of its exposed portion a small vein could be seen where it had been broken off, and about $\frac{1}{16}$ of an inch remained attached to the lateral sinus. Drs. Boot, Fuller, Kelly, and others, examined the case and saw the condition described above. His temperature never went to 100 but once after the operation, and in six weeks he left the hospital well, but wearing the drainage. He made a perfect recovery and works at his trade. I see him frequently, and his hearing in the operated ear, which had been *nil* for a year before the operation, is now nearly normal, a year after the operation.

Case III. Mrs. J., had earache, profuse discharge following poultices applied over the ear. Saw her with the family physician. Temperature fluctuating between 99 and 102 or 103; had some pain in mastoid region, but no swelling, drumhead freely opened about one-third, having sloughed away; swelling from upper and back wall of tympanum, pressing malleus far forward and downward; profuse flow of offensive pus. Advised opening mastoid, which they declined. I therefore abandoned the case. She was treated by the family physician by irrigation, politzeration, etc., for about six weeks, when the discharge nearly ceased. Temperature had been from 99 to 101 during this time. At this time she had a chill, and fever followed; temperature dropped to normal, and in a day or two became sub-normal. She could retain nothing in her stomach, vomiting whenever she moved, was dizzy and stupid. I was called again, found her tongue red and dry, pupils contracted. Told the doctor she had evidently meningitis, with effusion or cerebral abscess caused by suppuration in the mastoid, and that I believed she would die in a very few days. She soon sank into coma and died in two or three days. In this case no autopsy was secured. I firmly believe that an operation at the time I first saw her would have saved her life.

Case IV. Mr. Wm. T., 43 years of age, referred to me by Dr. Eugene Boise, had chronic discharge from the left ear; was taken with chills, and temperature ranged from 99 to 103. Was treated for fever for two weeks, when he was turned over to me on account of a profuse and offensive aural discharge and the conclusion by his

physician that his trouble was due to that cause. I found him somewhat delirious, restless and a profuse offensive discharge of pus mixed with blood issuing from his left ear. Diagnosed mastoid disease from signs and symptoms similar to those in case No. 3; advised operation as the only chance of saving life, which was, perhaps, at that time one in a thousand. They were strangers in the city, having recently come from Chicago, and wanted counsel. Two aurists and two other physicians saw him with me. One aurist thought he would recover without operation other than making a free opening into the tympanum, which he did with a Graefe knife, the other aurist and the two physicians thought there was no hurry about operating, and we left the case in care of one of the physicians. He grew constantly worse, continued delirious, vomited, became comatose and died in five days. No autopsy was had to settle the diagnosis, but he presented unmistakable signs and symptoms of abscess of the brain with pressure; had spasm in right arm and right side of face.

Case V. S. B. E., 17 years of age, referred to me by Dr. Graves; had been at Ottawa Beach for a month late in the season; had been bathing every day and diving frequently; came home with slight purulent discharge from both ears, and had some pain, but not severe; both drumheads were perforated; there was considerable swelling in the external auditory canal. I treated him a few days, when the discharge ceased, but swelling increased and extended over one mastoid. I concluded he had external mastoid periostitis and sent him to the hospital. Temperature 102. I made Wild's incision, $1\frac{1}{2}$ inches long through the periosteum, and pain ceased; temperature dropped to 99. Two days later the other side became painful and swollen and his temperature raised to 101. Under chloroform I made Wild's incision, and pain abated at once and temperature fell to normal, and in a week he left the hospital and made an uninterrupted recovery. This was a case of external mastoid periostitis *pure and simple*, and was caused by myringitis and extension of inflammation along the periosteum over the mastoid. This, like case No. 1, goes to prove that pain, swelling, edema and redness over the mastoid does not necessarily indicate that there is pus in the cells or mastoid antrum.

Case VI is of special interest for several reasons, which will appear later.

February 21st was called by Dr. Rutherford to see Miss H., 24 years of age. She had been suffering with pain in both ears for

twenty-four hours. On examination I found both drum membranes inflamed and bulging from accumulation of bloody serum in the tympanum. Temperature 101; pulse 100. No cause could be assigned for the ear trouble. The left ear being the worst I punctured the membrana tympani and a bloody serum flowed freely. Was called again in a few hours and opened the other drumhead with like effect as in the left ear. There was extreme congestion in both ears, and though the pain was relieved for the time, it soon returned in both ears. I ordered leeches and morphin to relieve the pain. Next day temperature 98.8 to 99. The next four days the temperature was below 99. Pain continued intermittent and pus was flowing from both ears. Fifth day temperature rose to 101. Complained of deep-seated pain in both ears and extreme sense of pressure. Leeches had been applied. Ordered blisters over the mastoids which filled well. Sixth day had counsel of several physicians. All symptoms aggravated. I determined to open the mastoid which I did on the left side, in the usual way, and found cells and antrum full of lymph and blood and some small deposits of pus. I opened from the antrum into the middle ear through the bony wall. I then made a Wild's incision on the right side. Pain was relieved on the left side, but continued on the right. At the operation we noticed just in front of the tragus a red spot as large as a 25-cent piece surrounding a recent leech bite, but thought it nothing serious. At night, to my surprise, it had spread to the size of three inches in diameter extending over the cheek and eye. We saw we had a case of erysipelas as a complication. It spread over face, head, neck, and in a few days had enveloped shoulders and had extended down the back as far as the last dorsal vertebra, but had not attacked the wounds over the mastoids which were made within a portion of skin, which had been blistered by cantharides. As the patient was delirious and seemed to be growing worse, and erysipelatos process steadily going on, not being checked by carbolic acid, sub-cutaneous injections of boric acid, etc., I determined to circumscribe it by cantharidal collodion. This was suggested by the fact that, though the whole head was enveloped by erysipelas, the part which had been blistered escaped. This treatment cut short the process, and the inflammation never went beyond the blister which extended in a line over the breast and back encircling the whole body. In a few days the erysipelas was entirely cured. At the end of thirty days she still had severe pain in her neck and arm and some in right ear. Pulse 100; temperature 101.4. The symptoms caused by erysipelas had made it impossible for me

to judge what part of her fever, delirium and pain were due to the ear or mastoid, and what part to the erysipelas, but as her temperature was above 101 and erysipelas cured, with pus flowing from her right ear, with swelling at the upper back part of tympanum bulging forward and downward, I decided to open the mastoid; which I did and evacuated two or three drachms of pus, and pain was relieved. From this time she went on to complete recovery. I removed a small sequestrum of necrotic bone from the wound in left mastoid during this time. She was completely deaf in both ears before the operation, but the ear first operated was soon restored to hearing, while the hearing in the other ear is still defective.

If I had such a case to treat again I should open the mastoid on both sides at the time of the first operation.

Case VII. Mr. M. D., 50 years of age, Hollander. When a boy had earache and a discharge from his left ear for several years which finally healed and quit discharging. Had no more trouble until he was 30 years of age, when it began to discharge pus in a small quantity. Had been deaf in the left ear for twenty years or more. About six months before had considerable pain, and a swelling took place just above and in front of the helix. He consulted an aurist who ordered poultices applied. This treatment was continued for some weeks. The doctor then punctured the swelling with Graefe's knife and evacuated some pus. He repeated this several times and continued the poultices. Patient, after some months, fell into the hands of another aurist who made an incision over the mastoid about half an inch long but got no pus. The case did not improve and the second aurist turned the case over to me, saying if I could do anything for him to do it. At St. Marks hospital I made a careful examination, and by probing through the incision first made by the Graefe knife I detected a hole in the temporal bone. Temperature 102; pulse 100. I then prepared him for operation, and under chloroform I made an incision about an inch in length in the abscess just in front of the helix, and by passing my finger in could feel a hole in the temporal bone about $\frac{3}{4}$ of an inch in diameter, and the duramater exposed; bone was roughened and I diagnosed caries of the temporal bone. I then extended the incision upward and forward over the temporal to the frontal bone commencing at the lower end of the first incision close to the helix; I made an incision about 3 inches in length upward and backward to the masto-occipital junction. I then made an incision from the latter down behind the ear to the tip of the mastoid. Keeping close to the bone and raising the periosteum I laid back the two upper

flaps, and in like manner separated the attachment of the ear and carried it forward and downward on the jaw and neck. Now having temporal bone exposed I separated it from the parietal and frontal bones, and with Volkman's spoon, gouges and chisel I removed the whole temporal bone while Dr. S. C. Graves held up the temporal lobe of the brain with his hand. The only portion of the temporal bone not removed was a small portion of the inner end of the petrous portion traversed by the internal branch of the caroted artery. The piece was loose and movable and with my thumb and finger I could grasp it and move it about. I should have removed this little piece but for the advice of some of the physicians present who thought the man would not get off the table alive, though he appeared in good condition. I said that the whole bone should be removed to be successful, for it is a well-known fact that as long as any of a temporal bone remains which has been once attacked with caries, the process will continue and it will cause suppuration and abscess. Under the press of opposition I left the piece of petrous bone. I then brought the flaps together after thorough washing with bichlorid 1.3000, I put in a large rubber drainage and united the flaps by interrupted sutures. The temperature fell to 99 and did not go above 100. The wound was kept well irrigated and in two weeks it had healed and pushed the drainage tube out. Four days after the operation the patient sat up, and in a week was walking around the ward. Temperature and pulse normal, and appetite good. About a week after the wound was healed completely he had some deep pain in the region of the tragus. Temperature began to fluctuate. A small swelling occurred over the junction of malar portion of zygomatic process with the temporal. I made an incision and removed a small piece of temporal zygoma and the wound healed. Pain and temperature continued for four days when the temperature fell to 97, and in two days he died. At the autopsy which was made by Dr. H. Lupinski we found between the duramater and pericranium in the temporal region on the operated side a fibrous deposit about as thick as the skull which had been removed, which formed good support and protection to the brain. The arachnoid membrane was free in the temporal region except in five points immediately beneath the hole first found in the temporal bone which was evidently caused by the punctures made with the Graefe knife, or a small silver probe. Surrounding the piece of petrous bone which was left there was an abscess full of rather thin pus from which septic absorption and septic meningitis had taken place, which caused death. The only signs of meningitis were at the base of the brain in the region of the petrous bone which was left.

This case is of special interest in connection with the consideration of mastoid and middle ear disease for the following reasons :

1. It was caused by suppurative otitis media.
2. It illustrates how nature may protect the brain and membranes, and tolerate pus in contact with the duramater.
3. It shows the great tolerance of the temporal region to operations.
4. It is fair to suppose that had the little portion of petrous bone been removed at the time of operation he might have recovered. Before the operation the patient could not open his mouth or move the lower jaw ; a week after the operation he could open his mouth and masticate his food.

I hope my paper will not lead you to think that I advocate the too free use of the chisel and mallet, for I certainly do not, but as many cases are obscure and liable to be overlooked I would advise vigilance and care, so that dangerous cases may not pass unnoticed until they have done irreparable damage.

Of the whole number of cases of ear diseases which come under my care a very small per cent require mastoid operation, although I believe I do the operation more frequently than most aurists. I believe I treat an unusually large number of ear cases and am called especially in those cases where operation seems necessary. The cases above reported are a few of the many operations I have done within the period of time covering those cases and they have been selected for variety and to illustrate the point which I have hitherto made that external swelling, edema, redness and pain over the mastoid are not necessarily signs and symptoms of pus in the cells, neither is it safe to depend upon them as a guide to a diagnosis of pus in the cells or to the necessity of an operation. The topography of the temporal bone varies to such a degree in different skulls that it is not always easy and in fact never possible to locate accurately the lateral sinus, semicircular canals and other important anatomical structures, which fact makes it necessary for an operator to be very careful in his manipulations and to have acquired a faculty of judging each case by itself. Skulls vary in form and size, but not more than do the mastoid cells and antra. A comparative study of

many hundreds of skulls, and experience in operating in the ear and upon the mastoid, have brought me to the conclusion that in skillful and experienced hands the operation of opening the mastoid is free from shock and comparatively free from danger, if done under antiseptic precautions. The operation should never be done with a drill. The chisel has not the elements of danger that the drill has. With the chisel and mallet one can work carefully and see what he is doing, with the drill the operation is done in the dark, so to speak. The antrum should always be reached and opened freely, and if there is pus in the cells they should be carefully scraped out unless found quite tough and sound, as is frequently the case when the operation is done early. The earlier the operation is done the less extensive it has to be. In all my cases never but one died after operation, and this young lady had been entirely unconscious for forty-eight hours, and was nearly moribund before the operation was commenced.

SYSTEMATIC ACOUSTIC GYMNASTICS IN THE
TREATMENT OF DEAFMUTISM AND CASES
OF NERVE DEAFNESS IN GENERAL;
A SYSTEM AS ADVOCATED BY
PROFESSOR URBANTSCHITSCH,
OF VIENNA.*

By J. STEELE BARNES, M. D.,
OF MILWAUKEE.

I DESIRE to call attention to a method that promises better results than any plan of treatment that has heretofore been instituted for improving the condition of a class of otological cases that have hitherto received but little benefit from treatment. In fact, the deaf ears have received the least attention, but now effort is being directed to a development of hearing in the deaf ears. I shall neither go into the etiology or pathology of deafmutism or of this method in its relation to deafmutism. I simply present this brief paper to again call attention to the possible results to be obtained by acoustic gymnastics, and to outline the manner of conducting the treatment.

The method is no longer one of speculation and experiment nor can it be looked upon as the fad of an enthusiast, as the results obtained by patience and perseverance clearly demonstrate it to be of sound and practical value.

The idea of aural gymnastics in the treatment of deafmutism did not originate with Professor Urbantschitsch, but so far as we know, with Bewus¹ over a century and a half ago. Later, Itard² in 1821, and Toynbee³ in 1860, reported success with

* Read at the Forty-Ninth Annual Meeting Wisconsin State Medical Society, West Superior, June 19-21, 1895.

¹ Beck. *Ohrenheilkunde*, 1827, p. 78.

² Itard. *Traite des Mal-ad. de l'oreille*, 1821, Paris, T. 2, p. 476.

³ Toynbee. *Die Krankh. des Gehörorg.*

cases treated by similar methods; but to Urbantschitsch we are indebted for developing the idea and proving its great value. His attention was called to what was possible of accomplishment with the method by his remarkable success in the case of a deaf-mute boy. He says,⁴ "Several years ago I obtained a surprising improvement of hearing by systematic acoustic gymnastics in the case of a deaf-mute boy referred to me for treatment. At first he was able to hear only vowels and single syllables spoken loudly in his ear; later, after a year, he could understand complete sentences spoken in a moderately loud voice and finally was able to receive ordinary, not deaf-mute instruction."

There is nothing extraordinary or intricate in the method. It is virtually a vocal training of the auditory nerve whereby a gradual irritability of the nerve for sound waves is set up. It is, as it were, a bringing into life and activity a hitherto lifeless nerve.

At the Vienna Policlinic Professor Urbantschitsch devotes an hour daily to the training of deaf-mutes by acoustic gymnastics, and it was there my good fortune to receive personal instruction and witness the surprising results obtained. It was indeed interesting to note the gradually increasing perception of sound in ears that were at first apparently totally deaf.

Instruction begins with the vowels. Two are selected, usually *A* and *O* as they are the most readily understood. The one to be used is first indicated to the patient by the lips and then in a loud and prolonged voice is spoken directly into the ear. The patient in the beginning may not hear a sound, but persistent and continued effort will, even sometimes at the first sitting, enable him to arrive at a differentiation, of two sounds. While it may not be a complete differentiation, the sound of *A* conveys a different impression to the mind than the sound of *E* shown by the effort of the patient to repeat. Again, this result may not be obtained until after several sittings. As soon as the differentiation of the vowels is mastered consonants are added to them, gradually increasing to long syllables, then to words and finally complete sentences.

As progress is made the distance from the ear at which the

⁴Urbantschitsch. *Wiener Klin. Wochenschr.*, 1898, No. 29.

exercise is conducted may also be gradually increased, and after a few sittings it is best to dispense with the lip method making the exercise purely acoustic.

While perception of sound is essentially necessary to gaining any progress in a case, conception of sound makes the perception easier, exerting a marked influence upon the rapidity of improvement. One may have perception long before he has any conception of a sound, but the sooner a sound conveys intelligence to the brain the quicker and more readily is that sound always distinguished. Therefore from the very beginning the attempt should be made to convey to the patient a meaning with every sound, to have him realize that every sound has an intelligent impression for the mind. In connection with the conception of sound I noticed a corresponding improvement in phonation and articulation. It was much easier for a deaf-mute to reproduce a sound that conveyed some intelligence to his mind than one that did not. I will quote from Dr. Goldstein⁵ who says: "A case is cited of a deaf-mute girl, who, during one of these acoustic exercises, was given the word *Anna*, the name of one of her sisters. This word was plainly heard and correctly repeated, yet when the meaning of the word was asked, the patient was unable to associate the idea of her sister's name with the word heard. When the explanation was given the young girl's surprise was great, and from that time a rapid improvement was noted as the patient made every effort to combine the spoken word with the idea implied."

Regarding the frequency and duration of the sittings I believe Urbantschitsch has found that short, continued practicing of from five to ten minutes, gives the best results. Practice should be daily at first, gradually increasing in frequency rather than lengthening the duration. However, each case must be a study of itself.

The pitch and intensity of the voice suited to the case must be determined and great care taken that the irritability of the nerve be not exhausted, as some ears are exceedingly sensitive and tire very easily. Should this occur, all practice must be stopped for a few days, otherwise more harm than good

⁵Goldstein. *Archives of Otology*, Vol. 24, No. 1, 1895.

will be done. To give you a more definite idea of this method I could quote you the record of several cases in which primarily a vowel spoken loudly directly into the ear could not be heard; but at the end of six to eight months' practice could understand and repeat correctly entire sentences, the instructor being five feet distant, and giving no aid by the lip method. However, I will not consume time in describing cases already published.

The results to be obtained depend largely upon the systematic manner in which the exercise is conducted, but the condition of the hearing and the personal factors of the case to be practiced naturally exercise great influence also. In the first place there must be an existing ability to hear and an ability for development of the hearing. According to Urbantschitsch⁶ however, "complete deafness is seldom found among deaf-mutes, and even if at times the ability of hearing seem entirely wanting, if only a trace of hearing is aroused, a further development is possible. The existing trace of hearing can be increased to the perception of a tone, the perception of a tone to a vowel, and this again to the perception of a word." It has been repeatedly demonstrated that in deaf-mutes who appeared totally deaf, there has resulted from systematic acoustic gymnastics a gradual improvement up to a high degree of hearing.

This method is applicable also to cases of acquired deafness resulting from scarlet fever, typhoid, cerebro-spinal meningitis, diphtheria, measles, etc., and not alone for the nerve, but for the long standing obstructive sequelæ do I believe it to be of utility. I have at present under treatment a man 44 years of age, who came to consult me about his right ear. Said his left was totally deaf and that he had not heard with it for the last twenty years. Examination showed beginning sclerosis, right middle ear; in the left ankylosis of ossicles with probable impaction of stapes; high tone tuning forks heard on mastoid; could distinguish vowels shouted directly into the ear; history dates from an attack of scarlatina. Treatment was instituted for the right ear and daily practice with acoustic gymnastics for the left, with the result that

⁶ Urbantschitsch. *Wiener Klin. Wochenschr.*, 1894, No. 19.

after seven weeks he is able to hear words distinctly at a distance of three meters, complete sentences at one meter. I have also used vibratory massage, but attribute very little to that as the case was of such long standing, and the improvement so marked and rapid the first two weeks. Later I hope to report this case more in detail.

The possibility then of improvement is certain; the limit of that improvement uncertain. As yet it is impossible to say to what extent the improvement in hearing may be carried. Only time, patience, and perseverance will demonstrate.

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TRANSLATIONS FROM FOREIGN CURRENT OTOLOGICAL LITERATURE. (ABRIDGED).

BY H. A. ALDERTON, M. D.,
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TRI-CHLORACETIC ACID IN CHRONIC SUPPURATION OF THE EAR.

Dr. W. N. Okuneff, St. Petersburg, (*Monat. f. Ohrenh.*, Jan., 1895). Tri-chloracetic acid is superior to others, *e. g.*, chromic acid, in that it does not spread, and after its use syringing with salt solution is unnecessary. The crystalline form of the acid makes its use very difficult, but following Cholewa, I use a common iron wire upon the end of which a loop is formed. A small crystal is engaged in the loop and passed once or twice over the glass of a burning lamp; it requires only a slight warming until the crystal melts in the loop as in a frame. The acid spreads quickly at the point of application, and it is better to remove the super-abundant acid by syringing. The cauterization is very painful so that a 10% or even a 15% cocain solution should be used previously to anesthetize the parts. The previously warmed cocain solution should be left for two to three minutes in contact with the diseased parts, during which time, two or three syringes should be prepared with luke-warm water, and the crystal engaged in the loop of the applicator. Then, with the aid of a hard rubber speculum, apply the crystal, after drying the ear thoroughly, to the mucous membrane of the middle ear as well as to the edges of the perforation. The mucous membrane and the edges of the perforation become white. Then to prevent the spreading and to remove the super-abundant acid, quickly syringe. The patient must meanwhile

cleanse the ear at home. After drying ear, I blow aristol, boric acid, etc., therein. Generally this procedure should be performed one to two times per week. But in those cases where one wishes to promote the growing together of the perforation, cauterization should not be done oftener than every eight or nine days, as too frequent cauterization destroys the new growth of granulation and connective tissue. Between applications syringings with disinfectants are made or in moderate otorrheas, drops (sol. resorcin 2%) applied, or the ear is left alone.

I have used this method mainly in cases of chronic suppuration with large perforations in the *M t*. In most, treatment by other remedies had failed. Others presented granulations upon the *M t* or the adjacent walls of the canal. Finally in cases where one wished to stimulate the epidermal edges of the perforations, in order to lead to its cicatrization.

In all cases treated as above, the otorrhea with its usual odor disappeared. The pus loses quickly its unhealthy color. The granular irregularity disappears, the mucous membrane becoming even and smooth, the small polyps also disappear. But with moderate sized polyps the cauterization fails, and here it is necessary to operate. Dry perforations, with epidermal edges, can in a shorter time be brought to cicatrization than by the use of other remedies and more permanently, if the middle ear process is at an end. It is not only necessary to restore the *M t* by cicatrization but also to restore its qualities of integrity and invulnerability in order to protect the inner parts from external unfavorable influences. Tri-chloracetic acid has the capability of doing this. Also after cicatrization the hearing may often, by systematic treatment, be brought on the road to a normal condition. This is especially true in childhood.

I believe that in persons from 5 to 25 years of age, by this means, always the end of the otorrhea, the cicatrization of the perforations, and the return of the function of hearing can be brought about.

In forty-two cases under my personal observation treated by this method, in thirty-eight the otorrhea ceased 90.4%, in two marked lessening 5%, in two slight lessening 5%; in twenty-three cicatrization of the defects and perforations, *i. e.*, in more than half of the cases. As in most of the cases the cauterizations were not systematically conducted, but were more or less occasional and irregular, so can one suppose that the results would be still more pronounced were the cauterizations systematically performed.

Where the physician does not hesitate to bestow a half hour upon his patient, and is not afraid of tediously progressive manipulations, then I repeat, can one always succeed in obtaining the complete cure of the chronic otorrhea and the re-establishment of the hearing.

Very true is this in childhood where we can always count upon the regenerative capability of the membrana tympani.

COMMUNICATION UPON DEEP BRAIN ABSCESS CONSEQUENT UPON ACUTE DISEASE OF THE TEMPORAL BONE.

Dr. H. Eulenstein, Frankfort a. M., (*Monat. f. Ohrenheilk.*) By searching the literature the author found eighteen cases in all, of otic brain abscesses occurring as sequelæ to acute diseases of the petrous bone. Also adds to these one observed by himself, operated upon with favorable results.

Dr. Eulenstein has only brought those cases together which without doubt are to be reckoned as acute, and which originated in direct connection with acute diseases of the petrous bone, or in which the origin was taken from an already disappeared acute ear disease, the traces of which were still clearly perceptible.

The eighteen cases are described by the following authors: Moos, Farwick, Guerder, Bezold, Schmidt, Gruber, Braun, Picqué, Baginsky-Gluck, Jansen, Ferrier-Horsley, Hoffmann, Grubert, Polo, Truckenbrodt, Joel.

The etiology of the acute temporal disease was measles in two cases, angina one, typhus one, influenza three, instillation of aqua fortis one, foreign body one, no cause given in nine.

The location of the abscess corresponded in all of the cases to the side of the diseased temporal bone, and was six times on the right side, eleven times on the left, and in one the side was not given. This fact, the more frequent occurrence on the left side is remarkable, especially as Koerner in his excellent work upon otic brain diseases, found in brain abscesses in general a remarkable preponderance upon the right side. The number of cases collected here is too small as contrasted to the great number of otic abscesses in general, to conclude therefrom a contrary opinion in regard to brain abscesses contracted from acute diseases of the ear.

Thirteen abscesses were situated in the temporo-sphenoidal lobe, five in the right side and eight in the left; four in the cerebellum, one in the right, three in the left; the situation was not given in one case. We observe here, as prevails in the total of otic brain diseases, that the preponderating majority had their seat in the temporo-sphenoidal lobe.

Multiple abscesses were observed three times, and of these, two abscesses in one case were observed in the cerebellum; in two cases two abscesses in the temporo-sphenoidal lobe. From the reports of these cases, there existed no ground for the belief that pyemia had existed, the abscesses also exhibited metastases.

The appearance of multiple otic brain abscesses in general is of great rarity, as Koerner has shown (in sixty-two cases of cerebral abscesses occurring only five times; in thirty-two cerebellar only four times), so is the relative frequency (three in eighteen cases) in the hitherto observed acute cases astonishing.

The reports give no valuable information as to the size of the abscesses or the existence or absence of a pyogenic membrane.

Of the so-called general symptoms of brain abscesses, expressive of the gravity of the disease, the state of the body temperature is of importance. Fever of irregular altitude occurred in thirteen cases, three cases ran without fever, and in two cases the temperature chart was not given.

Headache, one of the most constant symptoms of brain abscesses, from increased intra-cranial pressure, was explicitly noted as absent in one case.

Retardation of pulse was noted three times, irregularity once.

Choked disc occurred three times.

In most of the cases the sensorium was more or less benumbed.

The focus-symptom, so valuable for the diagnosis, existed eight times in the thirteen temporo-sphenoidal abscesses. There were observed interference with speech (in the left-sided temporo-sphenoidal abscesses); paralyzes, as paralysis of the opposite extremities and of the facial, hemiopia, ptosis, paralysis of the abducens of the same side. Moreover, photophobia, incontinence of urine, increased tendon-reflex, conjugated deviation to the right (in right-sided temporo-sphenoidal abscess), hemianesthesia, and hyperesthesia were observed.

Besides the general symptoms (fever, headache, benumbed sensorium) in the cerebellar abscesses, unilateral paralysis of the opposite facial was observed in one case, torticollis in one, suppression of breathing in one.

Death resulted in twelve cases, (eight temporo-sphenoidal, three cerebellar, one not noted); cured by operation six, (five temporo-sphenoidal, one cerebellar). A fatal termination occurred earliest in seven days after the beginning of the ear disease, latest about six months after beginning.

In the six successfully operated upon cases, recovery followed in from eight weeks to six months after the beginning of the primary disease.

As complications were observed, thrombo-phlebitis of the lateral sinus alone twice, thrombo-phlebitis and lepto-meningitis together once, pachy-meningitis externa three times. Of these, two with pachy-meningitis externa were cured by operation, one with sinus-phlebitis died after operation. Without operation both the other cases of sinus-phlebitis died, also lepto-meningitis as well as one case with pachy-meningitis.

The sinus-phlebitis was situated on the left two times, in one case the location was not given. In the three cases with sinus-phlebitis only one abscess was present.

The mastoid process was affected twelve times, as follows: periostitis, acute caries, empyema, etc.; in six cases there existed no mastoid disease.

In the thirteen temporo-sphenoidal cases mastoid disease occurred eight times, the latter being healthy five times; in the four cerebellar cases mastoid disease occurred three times, being healthy in one; (the situation of the abscess was not given in one case).

Of the eighteen cases, fourteen in all were operated upon as follows: mastoid operation alone three times, mastoid and opening of brain abscess nine times, opening of brain abscess alone two times.

Recovery occurred in both the cases in which the brain abscess alone was opened, the mastoid process being healthy. Of the nine cases in which both mastoid and brain were operated upon four were cured and five died. The three cases in which the mastoid alone was operated upon, as well as four cases not operated upon, all died.

The results of the operations, so far as concerns the brain abscess, was as follows: Eleven brain abscesses (eight temporo-sphenoidal, three cerebellar) were operated upon, five died (two cerebellar, three temporo-sphenoidal); and six were cured (one cerebellar, five temporo-sphenoidal). In eight cerebral abscesses operated upon five were cured, of three cerebellar one recovered.

The cause of death in the five fatal operative cases was once œdema of the brain, once rupture into the lateral ventricle and meningitis, hemorrhage and softening of the cerebellum once, no autopsy was made in two.

As regards brain pulsation, so important diagnostically, in the operative cases is mentioned once explicitly as existing, five times as being absent, while five times nothing relative to this condition was noted. From experience with brain abscess in general it may be said that absence of brain pulsation indicates the presence of pus, whilst its existence does not prove the opposite.

As regards the frequency of brain abscesses sequel to acute ear diseases as compared to those sequel to chronic suppuration, a collection by Grunert shows that otic brain abscess occurs in 9% through acute ear disease; in the Berlin clinic Jansen has observed only one brain abscess in 2,650 acute suppurations of the ear.

Dr. E.'s case shows the following points of interest: It proves percussion of the mastoid process to be an excellent diagnostic help; that in the absence of suppuration from the ear, by the intactness of the coverings of the mastoid process, only by the etiology, the location of the pain in connection with the result of percussion could be determined the diagnosis of disease of the mastoid. Also the necessity for early operation. Also in acute diseases the *usually valuable indications indicating opening of the mastoid process do not suffice.*

Also that at no time in Dr. E.'s case was the almost constant condition of drowsiness or unconsciousness present. The complete absence of fever during the attack is of further interest. So far as Dr. E. knows, the singultus which persisted for eight days, is an as yet unobserved early symptom, for the existence of which he can offer no explanation. The lowering of the body temperature upon the opposite half of the body to the abscess was also of interest. Further, the lowering of the hearing of the opposite side is a rarely observed symptom, although one should more often expect it since the center for hearing for the opposite ear lies in the temporo-sphenoidal lobe.

In the after treatment, cautiousness is required in the use of the tampon as it may, though loose, restore the pressure exerted by the evacuated pus; still one is constrained to resort to it whenever a somewhat severe hemorrhage occurs.

OBSERVATIONS ON HEREDITARY SYPHILIS OF THE MIDDLE EAR.

Chambellan, (*Journ. de Clin. et de Ther. Infantiles*, No. 26), demonstrates that hereditary syphilis does not affect the internal ear only, but may affect also the middle ear, and that without the internal ear being involved.

In the case of a child, 12 years of age, who had been treated in different clinics for otitis media sclerosa, the treatment, politerizations, had led to no amelioration. It was then, March 23, 1893, that they brought the child to me, then 12½ years of age, under treatment since about 4½ years of age. She spoke nasally like a deaf person. Both tympanums were manifestly sclerotic. No trace of suppuration and there was no history of such. Watch heard in O. S. on contact, in A. D. at 4 cm. Tinnitus in both ears. Heard better in dry than in damp weather. The integrity of the internal ear was absolute.

Under treatment the condition continuing to grow worse, the patient was questioned about her parents and it was found that the father died at 28 years of age, probably of cerebral syphilis, from that to infer that the young girl was affected by the taint of hereditary syphilis was only a step. The signs of Hutchinson were entirely absent. In spite of all, Chambellan prescribed 2 grams of iodid of potassium daily and mercurial inunctions.

Under the influence of the specified treatment, the condition of the patient ameliorated progressively; at the end of three months the mother said the child did not seem to be deaf at all on dry days.

The author concludes:—

1. Observation shows the existence of hereditary syphilis in the middle ear, a fact not noted until now. In the case, the child was 7½ years of age at the beginning of the disease.

2. This hereditary syphilis of the middle ear takes the form of otitis sclerosa.

3. This otitis sclerosa of heredo-syphilitic origin has a slow course, and may, if not entirely cured, at least retrocede in a satisfactory way as against labyrinthic otitis of the same origin, which has a rapid course and leads almost always to complete deafness. The first is therefore less grave than the second.

TWO CASES OF HEMATOMA OF THE EXTERNAL AUDITORY CANAL IN CHILDREN.

A. Barbier, (*Journ. de Clin. et de Ther. Infantiles*, No. 23). Hematoma of the canal is less known than of the auricle.

The author has observed two cases, one in a boy 12 years of age, the other in an infant 10 months of age. On examination, one could see at the entrance of the auditory meatus a tumefaction, a little hard, but yielding lightly to pressure, obstructing all the orifice and retaining the habitual coloration of the skin of the region. With both patients these sessile tumors were inserted on the inferior wall of the canal. The development had been slow and progressive; entirely painless. These symptoms suffice for the differential diagnosis.

In the two cases the author practiced ablation of the tumors with the bistoury; the cure was rapid.

The tumor removed, one saw that the fundus of the canal and the tympanum presented their normal aspect. Barbier, from the etiological point of view, notes that the two children were of feeble constitution, and manifestly tainted with scrofula.

A RARE CASE OF VERBAL DEAFNESS.

G. Masini, (*Bollet. d. Mal. dell 'Or., etc., No. 6, 1894*). A young man, 18 years of age, of feeble constitution, never had any important disease; subject since two years to losing, from time to time, the faculty of comprehending what is said to him, though he has retained the normal perception of sound. During these attacks he hears, but no more understands than if the language were foreign; he can repeat the words pronounced in his presence, but cannot seize their meaning; he can understand by signs, can even speak, but his ear does not control his tongue and his language is broken and disconnected. These phenomena last several minutes, then suddenly disappear; and as suddenly he comprehends anew what is said to him. These crises are accompanied neither by *aura* nor vertigo. The patient seems to remain conscious of what passes around him.

These disorders are evidently of cortical origin. Are they a manifestation of hysteria or do they represent a form *larvée* of epilepsy? Masini does not pronounce clearly, but seems to lean more toward the first hypothesis, in favor of which one could invoke the existence in this young man of a concentric contraction of the visual field.

A METHOD TO RENDER MICROSCOPIC PREPARATIONS OF THE HEARING ORGANS TRANSPARENT.

Dr. L. Katz, (*Berliner Klin. Wochens.*), has for many years used a method in the preparation of the hearing organs, that exhibits the membranous labyrinth quite isolated by means of the old spirits preparation, in which the connective tissue of the membranous labyrinth is very well preserved by the alcohol. Afterwards the preparation is decalsified by a 15% muriatic acid solution, and after two or three days a quantity of nitric acid (about 15 to 100 Cc) is added to this muriatic acid solution, the surrounding bone becomes macerated in such fashion that when placed in water, the membranous labyrinth can easily be extracted from it with the aid of the needle.

By the method Katz has lately used it is possible to bring the tympanic contents and also the membranous labyrinth clearly into view.

A temporal bone is placed about four to six weeks in chromic and osmic acid (0.25 chromic acid, 0.5 glacial acetic acid, 0.25 osmic acid to 100. aqua).

By this the nerves, after some time, become stained blue-green and intensified, and so can be much better observed. Then the hardened preparation is washed out and placed in about a 20% solution of nitric acid for about fourteen days when it is decalsified. It is then washed again and placed first in a 90% alcohol solution and afterwards in absolute alcohol.

All superabundant tissue, especially the dural covering of the bones, must be removed, because they obscure the transparency.

After the preparations have lain in absolute alcohol for three or four days they are put in xylol for twenty-four hours, this latter having the property of making the bones completely transparent.

The sections made should not be of greater thickness than 1 cm., because of microscopical reasons, but may be of any length or width.

Katz has recently modified the method in such way that a quite distinct osmic staining of the nerves within the membranous labyrinth is attained. The stapes is first extracted in such a fresh petrous pyramid and then the pyramid put in osmic acid, the fluid presses through the oval window with ease into the vestibule and into the turns of the cochlea, and distinctly stains all the nerve elements. When in pathological cases it is desired to preserve the stapes, then through the superior semi-circular canal the fluid is injected by means of a Pravaz syringe. It is essential that the

osmic acid is applied primarily to the fresh specimen. The osmic staining is so distinct that such a preparation satisfies almost ideal claims, especially for study purposes.

In order to submit the preparation to the most favorable possible investigation, it is placed in glass cells, with parallel walls. These cells are protected from the air by moderately strong cover-glasses. The cells are filled with Canada balsam, the preparation laid in and the cover-glass closed with avoidance of bubbles.

After one or two days the cover-glass through the balsam becomes adherent to the cell, and remains so unless brought near warmth.

One gains surprising views by means of the so-made preparation when brought under proper microscopical enlargements (four or five times).

ABSTRACTS FROM CURRENT FOREIGN OTOLOGICAL LITERATURE.

BY T. MELVILLE HARDIE, B. A., M. D.
OF CHICAGO.

Szenes contributes to the Sixty-sixth Congress of German Naturalists and Physicians (*Monats. f. Ohrenheilk*, October, 1894, *Jour. of Laryng.*, January, 1895) his experience in the treatment of 130 cases of ear disease with glycerin of carbolic acid and menthol. Instillations of 10% to 20% carbol glycerin were used in the initial stage of acute otitis media. If used warm before perforation takes place they frequently cause a retrogression of the process. A weaker solution should be used if perforation has taken place—10% and 15% solutions of menthol in oil are used in furuncle of the meatus and also in diffuse otitis externa. It frequently prevents recurrences. It should always be used after incision and removal of the contents of the furuncle. It may best be introduced on an absorbent cotton tampon and may be left in the meatus for twenty-four hours.

Gradenigo (*Ibid*) believes that many cases of sclerosis develop as a consequence of hereditary syphilis and that these differ only in greater malignity from the ordinary form met with in females with a tendency to hereditary ear disease or hereditary tuberculosis. The diagnosis may sometimes be difficult on account of the absence of any other symptom of hereditary syphilis, but we must always be on the lookout for it in cases of progressive deafness which comes on rapidly, with involvement of the inner ear, in young persons in whose families there is no tendency to hereditary tuberculosis or deafness. While this may be the only manifestation of the syphilitic diathesis it may be accompanied, as in the typical form, by malformation of the teeth and interstitial keratitis. In very rare cases it accompanies gummata and ulcerations of the nose and pharynx.

EXPERIMENTS ON THE IRRIGATION OF THE TYMPANIC CAVITY.

Bing (*Jour. of Laryng.*, April, 1895) carried out experimental irrigation with colored fluids on the temporal bones of adult bodies in which the cartilagino-membranous portions of the eustachian tube with the pharyngeal orifice had been carefully preserved. The membrana tympani was freely exposed and in its lower half a small hole was made with a pin, or else a wide paracentesis cut was made, or a portion of the membrane was excised. The preparation was then held as far as possible in the natural position. The colored fluid was injected through a catheter placed in the tube, and its outflow into the meatus was observed. Then the tegmen tympani and the cortical covering of the mastoid was chiselled away, and the tympanic and mastoid cavities so laid open were examined. It was found that with a wide paracentesis cut or a large opening in the drum most of the fluid ran out, and no coloration was found either in the upper cavities of the tympanum or in the antrum, while with a small perforation opening in the drum less fluid came out into the meatus, but, on the other hand, it could be found in abundance in the antrum and the mastoid cells. He concludes from this, with certain reservations:—

1. In the case of large openings in the drum, irrigation of the tympanum cannot quite achieve the intended object.
2. There is ample confirmation for the assertion that the outflow of injected fluid is sufficiently free, and easily effected through the opening in the drumhead.

On the treatment of purulent inflammation of the middle ear in which there is a small perforation at the point of a mammilla-form projection on the drum. He recently treated cases of this kind which are known to run a complicated or at least protracted course by means of a drop of liquor fer. sesquichlor. applied to the seat of the perforation by means of a probe. Rapid recovery followed. The medicament caused no particular reaction; it exercised a powerful astringent effect; the otorrhea ceased in a few days; the apertures quickly cicatrized, and under antiphlogistic and absorbent treatment perfect restoration took place.

Gomperz said that brilliant results often followed irrigation of the tympanic cavity through the tube in acute and chronic suppurative inflammations, but that the result could not be counted upon; that under certain circumstances it could do harm and lead to actual danger, and he would, therefore, advise that irrigation through the tube should be quite given up. In earlier years he

saw cases of acute inflammation of the middle ear, in which, when the irrigations through the tube were commenced, otitis of the mastoid process supervened in spite of a free outflow, and improvement took place only when this treatment was given up.

Gomperz made large openings in the drumhead of the dead body and injected a weak solution of ferro cyanid of potash through the tube with the usual pressure, so that the fluid could run out through the meatus. He was then able to make out, by means of the reaction with perchlorid of iron, that the fluid had reached the narrowest passages of the diploe nearest the cranial cavity. From this he thought it proved that by irrigation the infective organisms could be driven deep into the osseous parts into which they otherwise would not have reached. Then he dwelt upon the possibility that in cases of defect of the tegmen tympani or antrum the fluid might reach directly under the dura mater.

Reinhard recommended irrigation from the tube only in chronic cases, not in acute suppuration of the middle ear, whether the acute cases were of the muco-gelatinous or the purulent kind, especially when complicated with caries of the median and inferior wall of the tympanum. One condition must always be present: absolutely free egress through a sufficiently large opening in the membrane, which should be carefully ascertained beforehand by means of the air douche.

Politzer thought that Gomperz's fears were exaggerated. Anatomical experiments are not always applicable to pathological conditions as purulent inflammatory matter was always present in the mastoid antrum, and hence no fluid could be driven in. To give up these injections would be a great loss to therapeutics, as only by these means in a number of obstinate cases could recovery be brought about. The case of cerebral abscess in which death had suddenly taken place after injection was more easily explained by the shock induced by the catheterism and injection.

Scheibe agreed with Gomperz and Reinhard as to the danger of the tympanic injection through the tube in acute middle ear suppuration, but considered it necessary in the chronic inflammations.

IRRIGATION OF TYMPANUM.

Brieger considered the copious tympanic injections through the tube beneficial only when all inflammatory manifestations should have subsided. In contrast to the treatment recommended by Bing for the papillary perforations he advised active dilatation of the

orifice, and mentioned that in two cases he had removed the prominence with the snare for the purpose of histological investigation, and had thereby brought about a very good result.

Gruber thought that in chronic exudative inflammations the use of the injections should not be given up. There were cases in which the exudation could be removed from the drums in no other way, and moreover, the irrigations serve to allay the severe pain. In acute cases he did not use them for fear of driving the exudation into the mastoid cells. In chronic cases the danger is less, as in the majority of cases, there is already inflammation in the mastoid cells.

Szenes had seen two good results from the use of injection in acute inflammation of the middle ear, though he thought they should not be used as a rule.

Pins had good results from the use of irrigation in chronic and subacute cases excepting in one case where cerebral complications and probably abscess of the brain occurred. Vertigo and death followed one day after the second irrigation. The method is of great use if the perforation of the drum is sufficiently large to allow free exit for the fluid.

Gomperz replied to Politzer that when in pathological cases the cell-spaces of the mastoid process are filled with pus, the latter was exposed to a higher pressure during injection, which was a matter of some importance.

TREATMENT OF THE ATTIC IN CHRONIC SUPPURATION.

Gomperz, on the results of the conservative method of treatment in chronic suppuration of the upper cavities of the tympanum.

Gomperz reminded his hearers of his statistics (*Monatsschrift*, 1892 and 1893) of the results of the non-operative treatment of forty-nine cases in his private practice, which he, as far as it was possible, had followed up, and of twenty new cases. Of these latter, nineteen have so far recovered after an average treatment of twenty days that all secretion and formation of granulations have disappeared; that the mucous membrane up to the interior of the attic looked pale, soft, even epidermized, and the function of the ear had been raised very materially. He considered the excision of the malleus and incus as a very important extension of our therapeutic resources, but only applicable in suppurations of the tympanic attic when recovery cannot be brought about by the

conservative method, and that the recurrence of cholesteatomatous formations cannot be guaranteed against by excision of the malleus and incus. Why he believed so firmly in the conservative method is that so many subjects of cholesteatoma formation present constitutional dyscrasias, such as anemia, scrofula, apical catarrh, lupus and hereditary lues.

EXTRINSIC AURICULAR REFLEXES.

Bonnier read, at a meeting of the Paris Society of Laryngology and Otology, February, 1894, (Journal of Laryngology, March, 1895) an elaborate paper on auricular reflexes; of these the intrinsic reflexes are largely of theoretical interest only; the extrinsic, of more general value, are here reproduced.

1. *Auricular nerve.* From the close association of this nerve with the phrenic is derived the explanation of the hiccough, clucking or eructation sometimes occasioned by irritation of posterior wall of the external meatus.

2. *Pneumogastric branch.* Irritation of this branch causes the auricular cough.

3. *Auriculo temporal.* Through this nerve diplopia, and even optic atrophy, have been traced to disease of the ear. In a case of herpes of the eye and of the tympanum the central affection was probably located in the Gasserian ganglion.

4. *Glosso-pharyngeal.* Irritation through this may produce nausea and vomiting.

5. *Chorda-tympani.* Implication of this nerve may cause repeated swallowing of saliva, or burning or tickling feelings on the corresponding side of the tongue.

6. *Utricular nerve.* This nerve enables the animal to judge of the position of the head, the direct sensorial source of equilibration, and communicates with the cerebellum (vermis superior) from whence pass by the spinal bundles of the middle peduncle, the fibers which communicate centrifugal impulses to the fundamental fasciculus of the antero-lateral columns. There are numerous commissural connections. Most of those fibers of the utricular nerve which do not go to the cerebellum terminate in the internal or vestibular nucleus, the bulbar center for subjective direct cephalic orientation and the starting point of all the reflexes associated with vertigo. From this nucleus fibers run to the superior olive, which in its turn, gives off an important bundle to the nucleus of

the external oculo-motor (sixth nerve). Hence the oculo-motor reflexes observed in ear disease, with or without vertigo, such as strabismus, diplopia, pupillary contraction, nystagmus and disturbances of accommodation. Inversely violent excitation of the retina has been known to produce deafness.

7. *Saccular nerve.* Modifications of pressure are perceived by means of this nerve. It may, therefore, influence the respiratory and cardiac rhythm. Through it may be brought about the palpitations, feelings of oppression, epigastric pains, vomiting, and epileptiform or hysteriform attacks which accompany labyrinthitis commotion.

8. *Cochlear nerve.* Epileptic attacks have been known to be excited by musical sounds, and startings are similarly produced by sudden noises.

It will thus be seen how many reflex disturbances may arise from affections of the ear. Local treatment of a simple kind is often all that is required in order to allay them.

Gomperz (Monatsschrift für Ohrenheilk. October, 1894) on the recognition of protrusion of the bulb of the jugular vein into the tympanum during life.

Up to the present, five cases of dangerous hemorrhage following paracentesis of the membrane from perforation of the bulb of the jugular vein projecting into the tympanum have been published by Gruber, Ludewig, Hildebrandt, Seligmann and A. Brieger, the last one ending fatally. For the prevention of this casualty the writer recommends careful inspection of the membrane before paracentesis, and he sets forth the symptoms of this anomaly in cases in which the membrane was not inflamed, founding his views upon observations made in this direction. Blue discolorations in the lower half of the drum membrane, which, from their posterior extent and color, have nothing in common with the shadow of the niche of the fenestra rotunda are not uncommon. We find the blue spot either circular or bi-convex always close to the lower periphery of the drum, the convexity extending upwards and forwards. Finally he recommended for consideration whether in view of the danger of penetrating the bulb in an inflamed or opaque membrane, paracentesis should be practiced in the artero-inferior quadrant in a direction from behind forwards.

Zaufal thought that in cases of such hemorrhage we ought not to be content with simply plugging as deep as the membrane.

Small tampons ought to be pushed through the opening as far as the injured spot.

Politzer had seen hemorrhage into the drum after paracentesis of the membrane from perforation of the veins accompanying the nerve of Jacobson.

Habermann had seen dehiscence of the floor of the tympanum with projection of the jugular bulb reaching as high as the horizontal semi-circular canal.

LINING MASTOID CAVITY AFTER CHISELLING.

Reinhard experimented thus: After the opening of the middle ear by two parallel horizontal incisions in the posterior cuticular wall a flap was formed whose base was situated at the external auditory meatus. He continued these incisions outwards in the concha so far that thereby the external meatus was enlarged, the skin wounds were closed by means of sutures, and the flaps from the posterior wall of the meatus were fixed against the posterior wall of the osseous cavity from the meatus by means of tampons the tongue of the skin was pushed backwards into the large mastoid cavity so as to paper it.

He had made use of the above method in two cases of circumscribed caries of the attic and of the antrum without cholesteatoma. The patients had to wear the bandages only a short time and were soon able to leave the hospital—within ten to fourteen days. The after-treatment is easier because of the increased width of the external meatus, and from the cosmetic point of view this seems to him to give the best result after the chiselling operation. Those cases in which a persistent retro-auricular opening is to be striven for are excluded (cholesteatoma of the mastoid, extensive tubercle, caries, etc.) The method is suitable only for circumscribed caries of the ossicles and of the attic and antrum, in which the opening of the cavities of the middle ear is necessary. In properly selected cases he considers this the ideal method.

ABSTRACTS FROM CURRENT AMERICAN AND
ENGLISH OTOLOGICAL LITERATURE.

BY LEONARD A. DESSAR, M. D.,
OF NEW YORK.

FURUNCULOSIS OF THE EXTERNAL AUDITORY CANAL.

Dr. S. MacCuen Smith, (*Medical News*, January 19, 1895), in a practical article on this subject, expresses the opinion that aural furuncle is both infectious and contagious, with a tendency to recurrence from auto-inoculation, and that it occasionally manifests itself epidemically. He briefly summarizes the treatment as follows:

1. As antiphlogistic measures, use the leech or blister in front of the tragus, and hot antiseptic irrigation when indicated. Avoid the use of poultices.
2. As local applications, cleanse the canal with alcohol and insert an ample tampon of cotton-wool saturated with camphor or naphthol, renewing this every twenty-four hours, or oftener if required. This is at once antiseptic and analgesic.
3. As constitutional remedies, give tonics and alteratives with the especial recommendation of arsenic in the form of Fowler's solution. This should be administered in increasing doses until its physiological action is obtained.
4. As an operative procedure, make a free incision through the boil, and divide the periosteum down to the bone. This will prove necessary in well-advanced and chronic cases, especially when pus has already formed.

CLONIC SPASM OF THE TENSOR TYMPANI.

Dr. R. C. Heflebower (*New York Medical Journal*, March 16, 1895) reports a case of this rare and obscure affection which he is inclined to regard as a distinct form of chorea minor. The patient, a married woman, 35 years of age, had suffered from a chronic

otorrhoea of the right ear of many years' standing, with a large perforation.' After four weeks' treatment the discharge was arrested, and the perforation much diminished in size. In the left ear the membrane was a little lax, the reflex absent; hearing distance for watch sixteen inches. For several years the patient had complained of a clicking noise in the ears, accompanied by a twitching of the muscles of the throat. This had become gradually worse and annoyed her greatly, being exaggerated by any marked exertion. On inspection of the right membrane no movement could be observed, although the clicking noise could be faintly heard. In the left ear, however, a very perceptible indrawing of the central and lower part of the membrane could be seen at the time of each click; the muscles of the soft palate contracted synchronously with the tensor tympani. The larynx was not in the least implicated. In each ear the clicking was simultaneous with that in the other, and was never rythmical. It came on at irregular intervals, and was louder at certain times than at others.

The author had occasion some time ago to observe a second and more marked case of this affection, the sound being perceptible at a distance of two feet at times. The patient, a man of mature age, was considerably affected mentally, bordering upon insanity, and this of interest in connection with the fact that the father of the first patient was a confirmed lunatic.

A FEW OTOLOGICAL DON'TS.

Dr. N. S. Roberts, of New York, (*Medical Record*, June 1, 1895)* makes the following practical remarks on the treatment of aural affections: Don't treat earache with chloroform, laudanum, or camphorated oil, they are inefficient and may excite local inflammation; it is better to fill the ear with hot water, with or without glycerin, apply a poultice, and, if pain persists, apply a leech to the tragus. Don't advise or permit a patient with profuse otorrhœa to constantly wear cotton in the ear, it causes retention of the discharge, and operates against that diligent attention to cleansing and other treatment which would otherwise be given. Don't use the galvano-cautery in the auditory canal, it is liable to be followed by such consequences as necrosis, ulceration, otitis externa, or stenosis. Don't blow insoluble powders into the ear when there is a purulent discharge through a small perforation, it may appear to stop the discharge, but it does so usually by occluding the perforation, and may be followed by worse conditions.

Don't neglect to look for ear complications in all eruptive fevers, typhoid fever, diphtheria, and low types of pneumonia. Don't politzerize through nares in which there is stored up foul catarrhal mucus. Don't politzerize with much force in sensitive patients, or those having a thin, translucent drum membrane. Don't neglect to keep watch of the mastoid prominence in all cases of purulent otitis, and if tenderness, heat and swelling are found, to take measures to subdue a probable incipient mastoiditis. Don't overlook, in chronic ear disease, constitutional conditions such as lithiasis, scorbutus, tuberculosis, and syphilis. This precaution applies likewise to diseases of the nose and throat.

THE ELECTRO-PNEUMATIC MASSEUR IN TINNITUS AURIUM.

Dr. Chevalier Jackson, of Pittsburg, (*Jour. Am. Med. Ass'n*, June 29, 1895) reports the results obtained with the aural masseur devised by himself in the Manhattan Eye and Ear Hospital in the service of Dr. Clemens. Among twenty-two cases of otitis media catarrhalis chronica, associated with tinnitus aurium, treated with this instrument, two cases were unfavorably influenced, and twenty more or less benefited. The relief afforded in some instances was striking, and in one case the noise disappeared after three applications and have failed to return. On the ground of his experience Dr. Clemens regards the masseur contra-indicated in cases where the existing retraction of the membrana tympani and malleus causes an increased intra-labyrinthine pressure.

SUCCESSFUL MECHANICAL TREATMENT OF SOME UNUSUAL AURAL CONDITIONS.

Dr. William B. Marple, of New York, (*New York Medical Journal*, June 1, 1895) presents in detail the history of a most interesting case of aural disease successfully treated by a simple mechanical contrivance. The patient, a young married woman, had been greatly troubled for a year with vertigo which was referred by her in its beginning to the right ear. The vertigo only came on when the head was held in a certain position, *viz.*: tipped to the right, and was so severe that she often suffered from nausea. Always during the persistence of the vertigo her right ear felt stuffy, and the tinnitus which also existed, was worse. The hearing in the right ear for the watch was at first only one foot, while in the left it was fifteen feet. Inflation failed to improve the hearing in her right ear, the membrane of which was somewhat

retracted and thickened. Suspecting that the trouble was due to some tension anomaly, the author made use of a simple device employed by Dr. Clarence Blake, of Boston, in a similar case. He inserted a small piece of rubber dam used by dentists into the auditory canal in such a way that the ends lay against the anterior and posterior wall of the meatus, while the central bent portion rested against the short process of the malleus. Thus a pressure from without was exercised (estimated by Blake to be equal to about fifteen milligrammes) which was in a direction favoring the most complete opposition of the malleo-incudal articulating surfaces. This pressure from without counterfeited in a measure the effect of the traction from within. After the introduction of the rubber spring in Marple's case, examination several weeks later showed that the hearing distance for the watch had increased on that side to twelve feet. The vertigo gradually diminished so that the patient was able to sleep on her right side. At the end of three weeks when the rubber was removed, as a control experiment, the vertigo and nausea returned, but disappeared when the rubber was reintroduced, and this experience was verified on several occasions. After about five months the rubber was replaced by a paper disc inserted against the membrana tympani in the posterior quadrant. This effectively relieved the vertigo, which always recurred, however, when the disc became dislodged. It was permanently removed about one year after commencement of treatment, and since then there has been no return of the vertigo, although the tinnitus has persisted. In two other cases of disagreeable buzzing sounds in the ears when certain musical sounds were struck this symptom has been relieved by the introduction of the rubber spring.

EVACUATION OF THE TYMPANUM.

Donald B. Fraser, M. B., M. R. C. S., Eng., of London, Ont., (*Medical News*, April 27, and May 18, 1895) recommends the following simple method of emptying the tympanum in cases of disease of the middle ear, especially abscess: All that is necessary is a bulb syringe made of good rubber, having a suitable nozzle, and no valves. Compress the bulb by squeezing it lightly, introduce the nozzle into one nostril, press the other tightly against it, direct the patient to keep his mouth closed, release the bulb and allow its expansion to exhaust the tubes and ear cavity, and then press the bulb slightly and get the patient at the same time to blow

against the lips until the cheeks are fully inflated. Thus, inflation and evacuation is performed alternately, the two processes being effected by one instrument.

In the *Medical News*, May 18, Dr. B. A. Randall points out that evacuation of the tympanum can be more effectively secured by the Toynbee method which consists in deglutition with the mouth and nose closed. He cautions, however, against all these methods, which, in his opinion, are rarely of practical value.

DIFFUSE EXTERNAL OTITIS.

Dr. M. D. Lederman (*New York Medical Journal*, May 18, 1895) records a case of severe diffuse external otitis due to syringing the ears with a strong solution of carbolic acid which the patient had been advised to use by a friend for the relief of itching probably due to an aural eczema. When seen two days later there was serous infiltration of the face, marked congestion of the conjunctiva, and diffuse swelling of the auricles, this being especially pronounced on the left side which had been chiefly subjected to this heroic treatment. Serum filled the fossæ of the auricles, and exuded from a false membrane which covered the tragi, anti-tragi, and scaphoid fossæ. Testing with the tuning fork permitted the exclusion of internal ear disease. The watch could not be heard with either ear, but patient distinguished the voice when spoken to in loud tones. Under the author's treatment, consisting of administration of codein for the relief of pain, and the external use of Labarraque's solution as a deodorizer, rapid improvement occurred; later Politzerization was practiced. No narrowing of the canal resulted, and no permanent disturbance of the auditory perception. That absorption of carbolic acid had taken place was demonstrated by the ocular symptoms (*muscae volitantes*, affection of vision) and the passage of cloudy urine.

ABSTRACTS FROM CURRENT NEUROLOGICAL
LITERATURE.

BY WENDELL REBER, M. D.,
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OCULIST AND AURIST TO THE CHILDREN'S HOME—LATE JUNIOR RESIDENT
PHYSICIAN STATE HOSPITAL FOR INSANE, NORRISTOWN, PA.—FORM-
ERLY CLINICAL ASSISTANT WILLS EYE HOSPITAL; ALSO TO
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THE ALLEGED REFLEX CAUSES OF NERVOUS DISEASES.

Dr. Phillip Coombs Knapp, of Boston, read a paper, bearing the above title, before the meeting of the Philadelphia Neurologic Society, January 28, 1895, during the discussion of which, Dr. William Osler, of Baltimore, said: "With most of Dr. Knapp's conclusions I am entirely in accord. There are several conditions which we cannot, with our present knowledge, explain except on a theory of reflex influences. I refer more particularly to some of the curious phenomena connected with the adenoid vegetations in the pharynx and disease of the turbinated bones, such as persistent asthmatic attacks in children, which are cured radically and permanently by local treatment; also similar spasmodic affections of the bronchi in adults.

"Then we have the fact of a few well-authenticated cures of exophthalmic goiter by treatment of the turbinated bones.

"Of course I think that a great deal of twaddle has been written with reference to the influence of eye strain in producing epilepsy and chorea. Among the cases of chorea submitted to Dr. Stevens and the cases reported by Dr. Ranney there is scarcely a case of genuine Sydenham's chorea. They are cases of habit spasm. That such cases are cured by the removal of nasal and pharyngeal trouble is undoubted.

“On the question of headaches, Dr. Knapp takes, I believe, an extreme view. I think a larger percentage of cases of headache are cured by removal of ocular defects than he is willing to allow.”

Dr. G. E. de Schweinitz: “As one of my distinguished confreres has reviewed certain writings of mine with reference to eye strain with this comment, ‘it may suit the general practitioner, but it is not in accord with the experience of ophthalmologists,’ or words to that effect, I presume I am safe in saying that I should not be accused of too great partisanship on the side of ophthalmic medicine. I am in entire accord with Dr. Knapp in the belief that Sydenham’s chorea is not caused by hypermetropia and hypermetropic astigmatism, or indeed by any ocular anomaly, refractive or muscular. As I have elsewhere written, ‘the evidence seems quite as lacking that hypermetropic refraction is the basal cause of chorea as it is that the chorea is the cause of hypermetropia.’ In a constitution predisposed to chorea I presume eye strain is an important factor in fastening and provoking attacks. Pseudo-choreas are often the result of anomalies of refraction. That true epilepsy is ever produced by refractive anomalies I doubt, although I am quite sure that convulsive seizures of various types, and no doubt some of those which belong to epilepsy proper, are modified and sometimes checked for long seasons of time by the use of proper glasses, prismatic or sphero-cylindrical. The great difficulty resides in the fact that the reports of these cases have been rushed into print before the proper time has elapsed to test the permanency of the effect. The evident conclusion of the matter is that while we may not believe the extravagant assertions that have been promulgated with reference to the effect of eye strain, we do know that in the management of functional nervous disorders it is one of the influences that must be subdued before the treatment of the case is successful, for precisely the same reason that the defective functions of any other organ should be put into proper order in the management of these cases.

“I am not in accord with Dr. Knapp in his estimate, as I understand it, of the value of connecting refractive errors in the treatment of headache. In the first place, I do not believe that the cause of headache can ever be inferred from the position of the pain. The patient may experience the painful sensations from eye strain in any portion of the head—frontal, parietal, occipital or vertical region. Again, the pain is often situated between the shoulder blades, far down in the neck, and sometimes over the precordium. It is a notorious fact that in many cases of the most

pronounced 'eye strain cases,' the eyes themselves and their immediate vicinity have been entirely free from pain. I do not believe that there is the slightest doubt, other things being equal, that fully sixty per cent of functional headaches will be materially benefited or cured by the proper correction of refractive anomalies. * * * I am quite sure we all agree, and I think Dr. Knapp has said, that in the treatment of all of the cases the examination of the eye is of very great importance, precisely as is the examination of the nose, or, indeed, of any other organ, in order to make sure that the investigation of the case has been a perfect one."

Dr. Knapp, in closing: "There is, perhaps, not so much disagreement between my position and that of Dr. de Schweinitz as he thinks. I think I said that I make it a routine practice to refer almost every case of headache to the oculist, and I rather pride myself that in some instances, I have held firmly against the opinion of the oculist that the headache was due to eye trouble, and the subsequent history has shown the correctness of my view. I have gradually been coming to the belief that one of the distinctive symptoms in refractive headaches is the aggravation of the pain by the use of the eyes for near work. Another symptom that seemed to me to be important, although not so conclusive, is the location of the pain. With the routine practice of referring every case to the oculist, I have obtained satisfactory results in a great many cases, but there is still a considerable remainder of cases where treatment of the eyes had not cured the headache. (*Journal Nerv. and Ment. Dis.*, April, 1895.)

PECULIAR IRIS-REACTION IN THE PRESENCE OF POST-NEURITIC OPTIC ATROPHY.

Dr. Geo. M. Gould, (*Journal Nerv. and Ment. Dis.*, April, 1895), propounds a puzzling problem in neurology, as follows: Patient, a girl, 12 years of age, who had been afflicted with obscure spinal and cerebral disease presented, when she was first seen a year and a half ago, intense optic neuritis in both eyes. A year later there was absolute optic atrophy of the typical white variety. The most brilliant and concentrated light thrown suddenly or continuously through the pupil failed utterly to elicit iris-reaction or perception response. But, by seating the child before an open window, the street in front being illuminated by sunlight or diffuse daylight, within half a minute or more the pupils were found to

be of normal size. The parents had noticed that when the child played out of doors the pupils were of the size usual in other people. The motion of the contraction was too slow to observe, that is, one could not positively say that the myotic movement was taking place by watching the pupil attentively. In the same way the widening when the patient's face was turned away from the window and directed toward a moderately lighted room was perhaps more rapid, but still too slow to detect its progression.

Dr. Gould observes: "The problem, a double one, is this:

"*a.* How can the optic nerve be the apparent intermediate of pupillary response when following a peripheral neuritis that produces total blindness?

"*b.* Why does the pupil react to the stimulus of continuous diffuse daylight, and not to that of the most brilliant artificial light."

Without advancing any hypothesis, Dr. Gould then puts the following alternative queries that occur:

"Is it possible:

"1. That there is a localized molecular action of daylight upon the muscular iris-fibers distinct from central neural connection and control?

"2. That the stimulus, generalized, strong and continuous, of the daylight is powerful enough to carry some nervous impulse through the atrophied nerve fibers, and so far as the pupillary centers, but that this impulse is too weak to reach the visual centers?

"3. Had there been originally a synchronous atropic lesion of the optic centers or of the conducting paths beyond the pupillary centers (which would explain the blindness), but that still left a few fibers intact between the retina and corpora quadrigemina?

"4. Is there some hitherto unproved neural connection between the iris, *per se*, and the quadrigeminal bodies?

"5. Is the neural connection (as yet unproved) by means of the fifth nerve?

"6. Is the visual center stimulated via fibers direct from the retina and not by fibers from the pupillary center; in other words, are there distinct fibers that proceed to the pupillary center and end there, the neural impulse not proceeding hence to the visual center, whilst other distinct fibers proceed directly from the retina to the occipital lobe without calling at the pupillary centers?"

[The phenomenon is so unusual that we wish Dr. Gould had put forward some hypothesis for the condition.—W. R.]

NOTE OF A CASE OF SOFTENING OF THE RIGHT ANGULAR GYRUS, WITH LEFT-SIDED PTOSIS.

C. A. Herter, M. D., New York (*Journal Nerv. and Ment. Dis.*, January, 1895), records a case of left-sided ptosis that came to autopsy, when there was revealed an area of softening in the angular gyrus of the opposite hemisphere. History as follows: A man, 60 years of age, admitted to hospital in a state of stupor. Under observation two and one-half days, during which time the temperature ranged from 100° to 102°. There were some signs of tuberculosis of the lungs; there was a bad cystitis; the heart was very weak and rapid, and the radial pulse could not be felt most of the time that the patient remained under observation; right arm and leg quite flaccid, and were only slightly moved on painful stimulation; face not involved; both knee jerks lost; no rigidity anywhere; on the left side there was ptosis not complete; the left pupil was slightly dilated and reached less well to light than the right pupil. The autopsy showed the existence of extensive pulmonary tuberculosis with cavities, and pyelitis with suppurative nephritis. In the right hemisphere, just below the interparietal fissure, was a circular patch of softening 1 inch in diameter, occupying the angular convolution. The softening involved the cortex, and to a slight extent the white substance beneath it. Dr. Herter concludes "it is safe to refer the left-sided ptosis to the lesion in the right hemisphere."

[It would seem an open question whether the left-sided ptosis were due to the lesion in the right hemisphere or whether, perhaps, it was not due to a tubercular or other invasion of the nucleus of the left third nerve or some of its filaments in the fourth ventricle. —W. R.]

A CASE OF ALEXIA (WORD BLINDNESS) WITH RIGHT-SIDED HOMONYMOUS HEMIANSOPSIA.

L. Burns, M. D., (*Neurolog. Centralblatt*, 1894, Parts 1 and 2), recites an interesting case history. Patient, a woman, 32 years of age. Disease began two years before death with continuous headache; afterwards vomiting, then visual disturbances and vertigo. Five months before death diagnosis of cerebral tumor made. At that time, choked disc in both eyes, typical right-sided hemiopia, associated with short attacks of complete blindness. The patient further presented the symptoms of Wernicke's sub-cortical alexia, or Freund's "optic aphasia." Comprehension of speech and musical understanding unimpaired. Objects shown are recognized

but can seldom be named, although the first letter of the object's name is not infrequently mentioned. Printed and written letters are recognized, but cannot be named even when the hand of the patient while writing it is guided by the hand of the author. No words except very short ones can be recognized or read aloud (verbal alexia). Autopsy showed the existence of three gliosarcomata of the left occipito temporal lobe, which, at the time when the described symptoms of alexia were observed, had not yet reached the cortex; at least a craniotomy performed one month before the patient's death and exposure of the whole convexity of the occipital lobe and a large part of the adjoining parietal and temporal gyri did not reveal any tumor. The "choking" of the discs disappeared after the craniotomy, which, the author says, is a further proof of the theory that choked disc is not a true optic neuritis, but is the direct consequence of increased intra-cranial pressure.

OPTIC NEURITIS AS A SIGN OF BRAIN TUMOR.

Wm. H. Wilder, M. D., (*Chicago Medical Recorder*, May, 1895), makes some very interesting observations on the relative value of optic neuritis in brain tumor. He details a study of 161 cases in which either an operation or an autopsy had been performed. The nature and pathology of optic neuritides are reviewed, the theories of Graefe, Schmidt and Manz, Hughlings-Jackson, Leber, Edmunds and Lawford are stated and the points in which these different hypothesis are lacking are set forth.

Dr. Wilder remarks the infrequency of one-sided choked disc. In some cases the neuritis was more pronounced on one side than on the other, and this, in a large majority of the cases, on the side corresponding to the new growth. He is inclined to believe that the cause of optic neuritis must be sought in the irritation of the nervous elements by the products of tissue change in the growth, causing a descending inflammation, or that they cause a direct irritation of the nerve through the medium of the fluids of the optic sheath. He lays stress on periodical attacks of blindness as a clue to possible intra-cranial growth.

Of the 161 cases investigated, 90 were growths of the type of glioma and sarcoma with their mixed forms. Optic neuritis was found in 74.3% of the cases examined in reference to this sign. Out of the 104 cases with choked disc, 24 showed involvement of the cerebellum, whilst in 25 the motor convulsions were the seat of the neoplasm; 90% of the cerebellar tumors were accompanied by optic neuritis.

A CASE OF TABES, ASSOCIATED WITH REMOTELY PREVIOUS
HEMIPLEGIA, AND EXHIBITING UNILATERAL
REFLEX IRIS PARALYSIS.

The following case was presented by Dr. Joseph Collins before the March meeting of the New York Neurologic Society, and was fully discussed by the members:

J. J. D., 38 years of age, male, married, occupation policeman. Family history good. Denies syphilis and alcoholism, and there are no traces of either to be found. Has never used tobacco or indulged in excesses. The one pertinent fact in the history is that when about 23 years of age, he suffered an attack of hemiplegia, which disappeared entirely under mercurials and iodids. As Dr. Collins says, "this condition of things, occurring in an individual 23 years old, who was temperate, who had been singularly free from acute disease including rheumatism, who gave no history of injury or exposure or illness, and who made a complete recovery under specific medication, would point to syphilis as the origin."

Dr. Ward A. Holden, of New York, to whom the case was referred for careful examination of the ocular conditions, reports, among numerous anomalies, the following peculiar reaction: "The right pupil of medium size and reacts sluggishly to light, consensually and to accommodation. The skin reflex wanting in both. The left pupil very small and does not respond to light directly or consensually, but responds to accommodation. * * * The myosis seems to be due to sympathetic paralysis. Tension same in both eyes. This unilateral reflex irido-plegia, which has been seen a few times, has in the cases reported been associated with mydriasis and not with myosis, as in this case. The left reflex iris paralysis indicates a lesion in the centrifugal portion of the reflex arc for the light reaction on the left side." (*Journal Nerv. and Ment. Dis.*, May, 1895.)

THE SO-CALLED BLEEDING POLYPUS OF THE NASAL SEPTUM.*

BY W. FREUDENTHAL, M. D.,
OF NEW YORK.

SINCE Victor Lange and Schadowaldt have drawn our attention to these bleeding tumors, they have been studied anew, especially by German observers. Several cases have been described in this country, but as a whole we must accept that their occurrence is quite rare.

The bleeding polypus is situated most frequently sessile at the anterior portion of the septum. We are often taken by surprise when we attempt to remove such an apparently plain polypus and encounter a tremendous hemorrhage. It is this long and sometimes dangerous bleeding which caused Schadowaldt to name them "bleeding polypi." But while this name is a very good one, from a clinical standpoint, yet it is otherwise objectionable, as "polypus" may mean histologically anything and everything. As a rule, these polypi present themselves histologically as angiomata in various forms.

The occurrence of these angiomata of the nasal septum is as mentioned, quite rare. Only recently (*Archiv. Ital. di Otol.*, 1895) there were collected 131 cases of tumors of the septum, of which ten were syphilitic, twenty-five tubercular, and sixteen not diagnosticated. The remaining eighty tumors were: Sarcomata, twenty-nine; polypi, nineteen; carcinomata, eleven; papillomata, eight; angiomata, four; etc.

F. C. Cobb,¹ of Boston, collected nineteen cases of angiomata, but his own case is recorded as "a small growth

* Demonstrated before the German Medical Society of the City of New York, April 5, 1895.

¹ A case of angioma of the nasal septum. *Handbook of the First Pan-American Medical Congress*, Washington, 1893.

attached by a thin pedicle inserted into the septum." It occurred in a girl 15 years of age, anemic, who had suffered since six months from obstruction and bleeding from the right nostril. The growth was removed with "very slight hemorrhage," which is very rare in such cases. Besides the site healed completely in a few days, although the base had *not* been cauterized.

The case described by Victor Lange,² which is very interesting, corresponds more to the typical picture of these cases, and is as follows:

A woman, 29 years of age, suffered since five weeks from hemorrhages from the left nostril that were at times very severe. He saw a black, globe-like tumor which was seated with its broad base at the anterior portion of the septum, upon the slightest touch a profuse hemorrhage set in. After several unsuccessful trials he finally removed the tumor with a sharp curette.

He called it a soft fibroma, and says that these tumors must be rare, as among his many thousands of cases he only found six similar to the above mentioned. If we take the twelve cases reported by Schadowaldt, Alexander, Heymann and Scheier (*Archiv. für Laryngologie*, 1894, p. 259) and the three cases of Jonathan Wright, mentioned in his "Critical and Desultory Remarks, etc.," (*New York Medical Journal*, 1894, p. 364) we have all the cases reported up to date, and we must say that their number is surely very small, especially if we compare this with the thousands of "polypi" we see in other parts of the nose.

It is peculiar that the majority of these, if not all, have been noticed in women, but when Schadowaldt remarks that they might possibly have something to do with vicarious menstruation, as described long ago by B. Fränkel, I think he is greatly mistaken. The vicarious menstruation has quite another etiology, and as I have shown elsewhere,³ they arise generally from other parts of the nose.

According to my opinion it is simply a traumatism that produces these growths, a traumatism that is directed against

² Ueber einen seltenen Fall von Septum polypen. *Wien. Med. Presse*, 1892, p. 2071.

³ Severe hemorrhage from the nose. *The Post-Graduate*, March, 1894.

a place which naturally is supplied with an unusually large number of blood vessels. I imagine that if a blow or a strike or a fall is directed against this "Kiesselbach's" place in a manner so that it occurs as a direct blow, and no vessels are broken at once, this irritation causes in a very short time the formation of a new growth which, to a great extent, is composed of blood vessels.

I had never seen such a case until last winter when I had occasion to watch one during many months. Peculiar as it often is with the multiplicity of rare cases, a few weeks ago I saw another only much slighter in every respect. The history of the first case is briefly as follows:

Miss I. S., 22 years of age, a native of Russia, came to the German Poliklinik, complaining of nose bleeding, which had lasted for eight months. Since three months the bleeding was severer, without her having done anything for it. She attributes her trouble to a fall from a horse car, and says that soon afterwards she noticed that her right nostril was obstructed, and three months after the accident she could see a growth protruding from the nostril in looking into the mirror. On examination I could see, without a reflector, a round, reddish, bluish looking tumor of about 1 inch in diameter, seated at the anterior upper portion of the septum, covering, however, the locus Kiesselbachii. I must confess that at that moment I did not think of an angioma or the like, but tried at once to remove the polypus with a cold snare. But as soon as I touched the tumor such a severe hemorrhage set in that I hurriedly pulled out whatever I had in my loop. It was a small piece, but it took us half an hour before the profuse hemorrhage was stopped. I then sent her to St. Mark's Hospital, where I removed, with some difficulty, almost the entire tumor. Only a little stump was left. She grew so anemic from the loss of blood that in the next few days she fainted several times in the hospital, but she left it soon without having the stump cauterized. In the next few months I saw her but seldom at the Poliklinik. Now, *i. e.*, middle of March, she has terrible headaches before a bleeding occurs. At the same time the remaining stump gets larger. As soon as she bleeds, she feels easier. The bleeding occurs now three to four times daily, but not as much as before. She has besides tiring in the limbs, especially on the affected right side, and her general condition (great anemia, loss of flesh, lack of appetite) was so alarming that at this stage a fear for her life was not unfounded. She feared the hemorrhage, and for

that reason she did not want the cauterization done. At the same time her mental state was unsettled by the fear of the malignancy of her tumor. The reason for this fear was this :

Two years ago I had seen her sister, Mrs. Z., whose history I might be allowed to mention here in parenthesis:— Mrs. Z., 32 years of age, was suffering for four months with pains in the right side of the throat, the cause of which was a *sarcoma of the tonsil*. Nine months before that she also complained of slight pains in the same part, but neither I nor one of my assistants, who thoroughly remembered the case, noticed at that time anything of a tumor of the tonsil. I advised the removal of the tumor per os. She was willing to have it done, but failed to appear on the fixed day. She had consulted somebody else, who sent her to the German Hospital for operation. By kindness of Dr. Kammerer I was present at the operation, which was performed by him by external incision after a preliminary tracheotomy. Although the operation was performed in a short time and very little blood lost, the patient died, like the other five similar cases which I had seen, of pneumonia (*schluckpneumonie*).

Now this girl constantly asked me whether she would not get the same tumor as her sister had. All the German writers agree that these tumors are perfectly benign, and the microscopical examination of her tumor also revealed, as we shall see later on, a *fibro-angioma*. Nevertheless, I hesitated in making an absolutely favorable prognosis, firstly on account of her sister's illness, and secondly on account of one case reported by Roe. This author saw a case that by microscopical examination proved to be an angioma, but it subsequently degenerated into an *angio-sarcoma*.

I finally convinced the girl that it was best to have the rest cauterized, and after this was done thoroughly, the bleeding stopped. I saw her six weeks later, and still see her from time to time, but in spite of good diet, iron, etc., her anemia is still great.

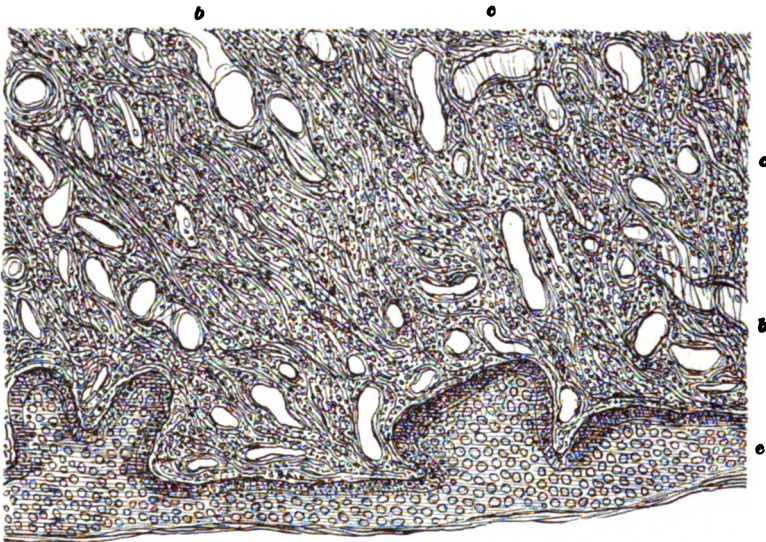
I will now give you the details of my microscopical examination :

The surface of the tumor is covered by a stratified epithelium. The breadth of the epithelial layer varies greatly according to blunt prolongations penetrating into the subjacent tissue. The layer of columnar epithelium everywhere sharply defined from the subjacent tissue. The latter exhibits irregular elevations reminding one of obtuse papillæ, to which, however, no elevations correspond on the surface of the tumor.

With the low power of the microscope the main mass of the tumor appears to be composed of a delicate fibrous connective tissue,

richly supplied with protoplasmic bodies. The latter mostly arranged in clusters, being least numerous in those portions of the tumor in which the fibrous structure is most pronounced. The tissue is everywhere traversed by numerous light fields, mostly empty, and only occasionally filled with red blood corpuscles. The smallest gaps are seen near the surface of the tumor, larger gaps of the type of arterial and venous blood vessels are found only in the central portions of the tumor. Besides, there are numerous light fields throughout the tissue, filled, apparently, with protoplasm, but not distinctly defined from the surrounding tissue. (See Fig. 1.)

FIG. 1.



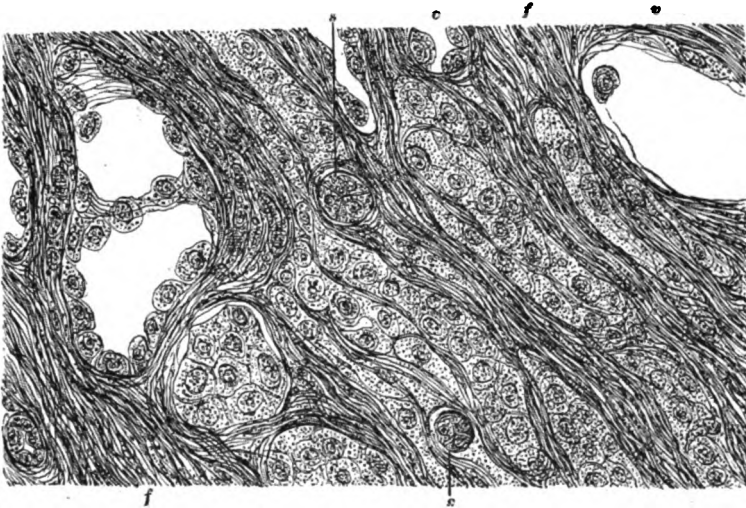
SECTION OF FIBRO-ANGIOMA OF NASAL SEPTUM. X 75.

e—Stratified epithelium. *c c*—Delicate fibrous connective tissue. *b b*—Blood vessels.

With the higher power of the microscope we recognize at the first glimpse bundles of fibrous connective tissue, varying in amount, though nowhere dense. Between these bundles we see vessels, mostly of the type of blood vessels, and again largely prevailing capillary blood vessels, whereas arteries and veins are comparatively scanty. Again the calibers of the capillary blood vessels vary very much. Some of the capillaries are narrow, slit-like, and straight; others are wider and more or less convoluted. The endothelial lining of all the blood vessels, especially of the capillaries, in many places conspicuous; in others it is torn away and clustered within the caliber of the vessel; or entirely absent, obviously by being

dragged away in the process of section cutting. The endothelia are without exception of large size. Although only a few vessels contain red blood corpuscles, I have no doubt the vast majority of the vessels of the tumor are blood vessels and not lymphatics. It is a well-known fact that newly formed blood vessels, such as we have before us, always are marked by the presence of large-sized endothelia. Besides I have nowhere seen a reticulum of coagulated fibrin within the calibers, such as we invariably meet with in lymph vessels. Special interest attaches to apparently solid functions made up of three or four endothelia. (See Fig. 2.) There can be no doubt that we have before us stages of development of blood

FIG. 2.



SECTION OF FIBRO-ANGIOMA OF NASAL SEPTUM. X 300.

c—Capillary blood vessels in transverse and oblique sections. *ss*—Solid formations of endothelia. *ff*—Loose fibrous connective tissue. *v*—Vein lacking endothelia.

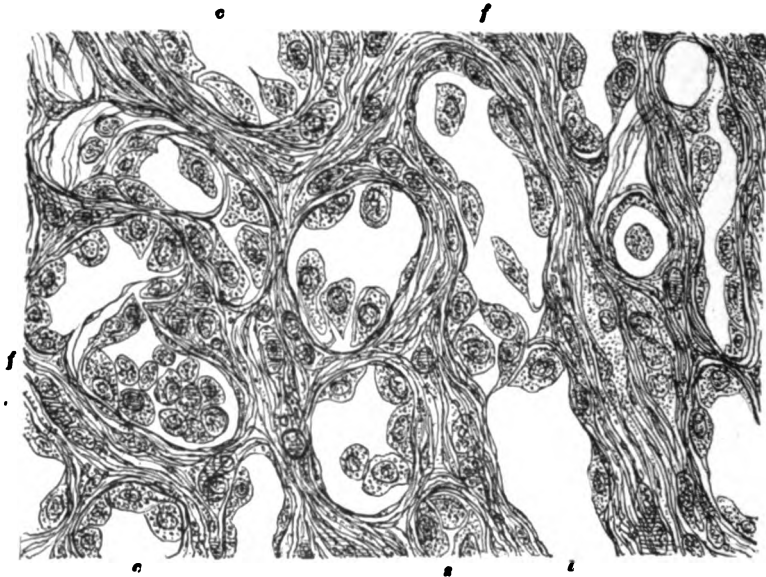
vessels, which latter, as is well established, are originally solid tracts of endothelia and afterward are hollowed out by a liquefaction of the central portions of the endothelia. (See Fig. 2.)

All doubts as to the nature of the vessels before us vanish upon carefully studying them with a magnifying power of 600 diameters. Again we observe large and distinctly nucleated endothelia either lining the walls of the capillaries or detached and clustered together owing to the process of section cutting. Exceptionally we meet with capillaries destitute of endothelia. The surrounding fibrous connective tissue is rather scanty wherever the blood vessels are

abundant. In this delicate fibrous connective tissue we see numerous protoplasmic bodies varying in size from that of nuclei to that of fully formed endothelia. This fact proves that the formation of capillaries in the tumor was progressing uninterruptedly. (See Fig. 3.)

There is no doubt that even a recurrence of the tumor may appear, although its nature must be considered entirely benign.

FIG. 3.



SECTION OF FIBRO-ANGIOMA OF NASAL SEPTUM. X 600.

c—Capillary blood vessels lined by large endothelia in transverse section. *l*—Capillary blood vessel, with partly detached endothelia, in longitudinal section. *s*—Cluster of endothelia. *f f*—Delicate fibrous connective tissue.

The diagnosis from what has been said of the structure of the tumor is *fibro-angioma*.

The specimens of this tumor have been seen by Dr. C. Heitzmann, of this city, who corroborated the above diagnosis, and helped me greatly in finishing these drawings, for which I owe him thanks.

943 Madison Avenue.

ABSTRACTS OF PAPERS READ AT SEVENTEENTH
ANNUAL CONGRESS OF THE AMERICAN
LARYNGOLOGICAL ASSOCIATION,
ROCHESTER, N. Y., JUNE
17-19, 1895.

REPORTED BY M. D. LEDERMAN, M. D.,
OF NEW YORK.

Dr. J. W. Gleitsmann, of New York, read a very exhaustive and at the same time concise paper on "Surgical Treatment of Laryngeal Tuberculosis," in which he expressed his views upon the modern treatment of laryngeal phthisis. This paper must prove a valuable addition to the literature of the subject under consideration, as the author has collected all important references, dating from the initial surgical treatment of the disease, viz: tracheotomy for tubercular laryngitis in 1834. The first attempt at endo-laryngeal treatment was made by Mr. Marcet, as far back as 1869. He punctured the tubercular infiltrations, but his labors did not attract the attention of the profession at the time. It remained for Morris Schmidt to more fully dilate upon the treatment of this distressing affection, by incisions, which he did by publishing his method of operating in 1880.

Dr. Gleitsmann touches upon the various surgical methods suggested in the treatment of laryngeal tuberculosis: (1) Incisions; (2) submucoid injections; (3) galvano-cautery; (4) electrolysis; (5) curettment; and (6) extra laryngeal measures. Of these he considers curettment to be the most modern treatment, and strongly advocates its application in preference to all others. He has searched diligently for recorded opinions of those who have employed same, and out of seventy publications, he could only find six writers who spoke indifferently or unfavorably about it.

The author considers both sides of the question in a practical manner. He does not expect that the surgical treatment of the larynx "will directly exert a favorable influence on the almost always present pulmonary complications," but he states that we are justified in calling a patient cured of his laryngeal disease, "when, in spite of the continuance of the pulmonary disease, the laryngeal symptoms have subsided; when the larynx bears a normal aspect, and when no trace of the disease is found at a post mortem."

Up to the present time, no treatment has been tried which will prevent relapses, but Dr. G. thinks that, with proper curettment, relapses will be less frequent. Curettment is not suitable for all cases of laryngeal tuberculosis, and the more definite the indications are drawn, the better the results of the operation will prove to be. Some observers have claimed that curettment hastened the pulmonary process. The author does not deny the possibility of such a condition, but is inclined to believe that the aggravated symptoms are merely a coincidence. Other objections brought forward are hemorrhage following the treatment, the painfulness and the difficulty of the operation. Bleeding can be controlled by a solution of lactic acid and perchlorid of iron. Strong solutions of cocain repeatedly applied will materially lessen the pain accompanying the surgical procedure. Practical manipulation will, no doubt, overcome the technical difficulty which was experienced by some operators.

In demonstrating the advantages of the remedy advocated, the speaker claimed that curettment is a rational proceeding, based upon sound surgical principles. He drew the *simile* of a surgeon excising a tubercular joint, thus ridding the system of one source of infection, and remarks that the laryngeal operation acts in a similar manner. He agreed with the majority of operators, that this endo-laryngeal treatment, applied in properly selected cases, is by far better, quicker in action, and more effective, than any other method as yet suggested. The opinion that the operation was justifiable and should be performed before the disease has reached an inoperable stage, is strengthened by the knowledge that a patient is better able to battle against the ravages of this disastrous disease, if the ulcerative process could be limited to a single area.

Dysphagia is probably the most troublesome symptom of the local manifestation. This difficulty is caused by the infiltration of the arytenoid region, and in such cases the author strongly recommends curettment. Here the dense hard swelling can be removed

by Krause-Heryng's double curettes, generally at one sitting. The wound as a rule heals very rapidly, and the patient experiences great relief. It is for this reason that arytenoidectomy is in favor with most operators, in cases where curettment would otherwise be contra-indicated, viz: In active pulmonary disease with hectic. With the relief experienced, the individual is once again able to take sufficient nutriment, resulting in general improvement. The voice and cough is also benefited by surgical treatment, as cicatrization of the ulcerations takes place. Small, sharply defined ulcerations or dense localized infiltration, prove more amenable to treatment than extended shallow ulcerations or edematous structure. Bacteriological examination lends some weight to the prognosis.

Taking up the records of different operators, Dr. G. quotes the statements of Heryng, Gugenheim and Krauss, who, altogether, treated 455 patients. In some of these cases the larynx remained in healthy condition for one to eight years.

The author's experience is based upon twelve cases, all of whom had pulmonary complication. Some patients were operated upon for infiltration of the posterior laryngeal wall; in others the ventricular bands were excised, and arytenoidectomies were performed in some instances. "One patient died from heart failure, and another from advanced pulmonary disease. Four patients are without recurrence of laryngeal disease from six to ten months; one of whom had disease of the posterior laryngeal wall, another of the ventricular band, and two of the arytenoid region." The doctor mentions a case of tuberculous ulcer on the base of the tongue, first seen by him in 1888, and that during the summer the disease extended to the left tonsil, soft palate, the whole lingual surface of the epiglottis, and the left ary-epiglottic fold. Heroic treatment in this case was followed by a cure, the cicatricies of the palate and ary-epiglottic fold being plainly seen six years later. Referring to submucoid injections, Dr. G. calls attention to the initial work in this line by Krause and Heryng in 1886, and also to the suggestion of Dr. Major, who advised frequent and repeated injections at short intervals. The former investigators employed lactic acid as the medicament, while Dr. Chappell has derived excellent results from the use of an oily preparation of creasote.

Electrolysis and galvano-cautery are mentioned as being used by some operators, but the author prefers the more rapid and decisive method in the treatment of this lingering disease. Tracheotomy is favorably commented upon by a number of

authorities. Cases are cited in which the laryngeal disease materially improved after this operation was performed for serious stenosis. The author states that tracheotomy will always retain a prominent place in the treatment of laryngeal tuberculosis. The following indications for curettment are recommended:

"1. In cases of primary tuberculous affections without pulmonary complications.

"2. In cases with concomitant lung disease which is either in the incipient stage or has at least not progressed to softening and hectic conditions.

"3. It is best adapted for circumscribed ulcerations and infiltrations of the larynx especially.

"4. For the dense, hard swelling of the arytenoid region, the ventricular band, the posterior wall, for tubercular tumors and affections of the epiglottis.

"5. In advance lung disease with distressing dysphagia resulting from infiltration of the arytenoids, curettment is justifiable as the quickest means to give relief."

Contra-indications are:

"1. Advanced pulmonary disease and hectic.

"2. Disseminated tuberculous disease of the larynx, leaving little or no healthy tissue.

"3. Extensive infiltrations producing severe stenosis, when tracheotomy is indicated."

It is not to be recommended in nervous, distrustful patients, who lack the necessary perseverance or confidence in their physician.

IS ACUTE TONSILLITIS IN ANY WAY DEPENDENT UPON THE RHEUMATIC DIATHESIS?

Geo. B. Hope, M. D., of New York, read a paper in which he took the ground that the theory of acute tonsillitis very generally attributed to an underlying rheumatic or gouty diathesis is, in the writer's experience, not substantiated by clinical observation, and believes that the accepted version is largely due to the natural disposition to fall into line with time-honored views and unconsidered statements.

The issue is made that patients subject to attacks of tonsillitis do not commonly afford a history of rheumatism proximate or remote, while, on the other hand, the rheumatic individual rarely suffers from inflammation of the tonsil; that it is noteworthy that the tonsil in later life becomes less and less disposed to acute

attacks, while the rheumatic age is more confirmed. Furthermore, as a local acute manifestation rheumatism should select a sero-fibrous rather than a neuro-fibrous or lymphatic structure like the tonsil. Carrying the argument further, it is claimed that suppurative peri-tonsillitis is eminently of an infectious nature, and is frequently a sequela of intra-nasal operation quite independent of climatic or constitutional conditions.

The conclusion reached from the above is: that the favorite anti-rheumatic remedies as guaiac and the salicylates, as addressed to the causation are either erroneous in practice or act independently and by methods not clearly stated. Such remedies should not be considered specifics, but should be adjusted to the varying conditions of the subject. Moreover, it is not proven that the treatment does abort or mitigate the course of the disease.

TRANSLATIONS FROM CURRENT FOREIGN LARYNGOLOGICAL LITERATURE. (ABRIDGED).

By J. W. GLEITSMANN, M. D.,
OF NEW YORK.

A CASE OF CIRCUMSCRIBED GUMMATOUS ULCERATIVE
TUMOR OF THE LARYNX.

Dr. E. W. Tschlenow of Moscow, (*Wiener Medicinische Wochenschrift*, 1895, p. 235), calls attention to the fact that in diseases of the larynx the seat of pathological lesion is of utmost importance in diagnosis. The thickening of the anterior surface of the posterior wall of the larynx without any other important symptoms suggests a suspicion of tuberculosis. Indeed sometimes one is entitled to make such a diagnosis. Although this is a very pathognomonic location for disease of the larynx, there are other seats very characteristic of the disease which, in addition to external appearance due to pathological changes, aid in diagnosis. I may refer to an article in Dr. J. Gottstein's book, 1893, page 316, which reads as follows:

"In diseases of the larynx, especially of the ventricular bands, the ary-epiglottic folds and the vocal cords, we notice a thickening which is diffused into the surrounding membrane, and, where the appearance of such lesion is not considerably changed, tubercular or syphilitic infiltration may be suspected." The same author also presents the following points for differential diagnosis between tubercular and syphilitic infiltration: "In tubercular thickening there is an even surface of a faint, pale and livid color. The syphilitic thickening is irregular, dark red in color, and is surrounded by a red inflammatory area. The syphilitic infiltration ulcerates more rapidly than the tubercular and its process is very acute."

Prof. Schrötter confirms this last assertion by saying: "An excessively inflamed mucous membrane may, within twenty-four hours, be converted into a diffused ulceration." I now report the following case from Prof. Chiari's Klinik: J. M., 29 years of age, came to our Klinik on December 10, 1894, complaining of difficulty of swallowing, coughing at certain times, and also some hoarseness. He was in good health until nine years ago when he acquired a chancre with its usual complications. He was then referred to Prof. Auspitz. Five years after his first infection the patient began to complain of laryngeal symptoms, and was then referred to the laryngeal division of Prof. Schnitzler, where he was treated with iodoform insufflations, morphin internally, and later, with local applications of a 50% solution of lactic acid. This treatment was unavailing. He was now put upon the iodid of potassium treatment, and within three weeks he showed remarkable signs of convalescence. He was, however, only relieved for a short time as all his previous symptoms recurred, and being dissatisfied with this treatment he presented himself to the Poliklinik.

Examination of internal organs: At the right pulmonary apex there is slight dullness, yet at this time he seldom coughed, and expectorated very little. Arterio-sclerosis is found, but no other pathological lesion.

Laryngeal examination: The mucous membrane is slightly red, but almost normal, and at the upper portion of the anterior surface of the thickened arytenoid cartilage a pea-shaped tumor, the size of a hazelnut, can be seen. Its mucous membrane is smooth and is diffused into the surrounding membrane. Its color cannot be differentiated. On the upper surface of this tumor there is a slight contraction. The right side of the larynx is normal and both halves of the larynx move normally. The vocal cords are slightly reddened and do not approximate during phonation, leaving a spindle-shaped opening between the ligamentous portions. The cartilaginous part of the left cord cannot be seen, being covered by the tumor. The ventricular bands are normal. The trachea shows slight reddening.

After this examination the question of diagnosis arises; is it lues or tuberculosis? There is one more pathological lesion in this patient which assists us in making a positive diagnosis. The examination of his pharynx reveals an ulcerated swelling which covers the *pars oralis* and the *pars laryngea*. It extends upwards to the base of the uvula, downwards its border reaches the *aditus*

laryngis, and latterly to the palato-pharyngeal ligaments. The swelling is funnel-shaped and is covered with a fatty, dirty secretion. The gummatous swelling of the pharynx enables us to make a positive diagnosis of syphilis.

Treatment: In this patient the gummatous infiltration recurred frequently and disappeared readily under the potassium iodid treatment, eventually terminating very favorably. This treatment was discontinued and mercurial inunctions substituted. The ulceration of the pharynx was cauterized with nitrate of silver, an occasional spray of bichlorid of mercury 1 to 1,000 being used. The larynx itself was untreated. The examination of patient on March 14, 1895, revealed the cicatrix of the previous ulcerations upon the posterior wall of the pharynx. On the left arytenoid cartilage there appears a small red thickening, the remains of the swelling which was curetted two months previously. The patient received altogether twenty-five applications of unguentum hydrargyri amounting in all to 3 grams, and from the beginning of January until the end of February, 2 grams of potassium iodid were given daily.

ABSTRACTS FROM CURRENT RHINOLOGICAL AND
LARYNGOLOGICAL LITERATURE.BY M. D. LEDERMAN, M. D.,
OF NEW YORK.A CONSIDERATION OF THE VASCULAR MECHANISM OF THE
NASAL MUCOUS MEMBRANE, ETC.

Dr. Jonathan Wright, Brooklyn, (*American Journal of the Medical Sciences*, Vol. CIX, No. 5). In an interesting paper the author describes the vascular anatomy of the turbinated bodies. Excellent illustrations accompany the writer's explanations. The venous sinuses, he states, depend largely for their expulsive power upon their muscular walls. In chronic inflammation of these parts the walls of the vascular spaces become much thickened by the overgrowth of non-elastic fibrous tissue. This interferes with the physiological action of the muscle fibers. In hypertrophic rhinitis there is a paresis of the walls as well as a dilatation of the lacunæ. The gradual absorption of this muscular tissue, due to the increasing pressure of the fibrous hyperplasia, accounts for the atrophic state. He further pictures the effect of the galvano-cautery upon the mucous membrane, and expresses the opinion that marked atrophy has resulted from its application.

TUBERCULAR TUMORS OF THE LARYNX.

Dr. J. P. Clark, Boston, Mass., (*Ibid*). After noting similar cases reported by other observers, the author details the history of his patient. The growth was found on the left ventricular band in a woman 31 years of age. No tubercular history was elicited. It was a simple senile growth, covered with mucous membrane, concealing, during respiration, most of the left vocal cord and part of the right. The larynx was otherwise normal except for

a slight infection of the cords. Under cocain anesthesia the tumor was removed by means of the gold wire snare. Hemorrhage was very slight. The gross appearance of the growth resembled a fibroma. Examination of the lungs gave negative results. Microscopical examination of the tumor showed it to be composed of miliary tubercles. No bacilli were discovered.

HEMORRHAGIC PHARYNGITIS.

Dr. Nahier (*Ibid*). Effusions of blood from the pharynx occurred in a shopman, 29 years of age. These symptoms occurred twice; the quantity equaling a tumblerful. No lesion existed. The bleeding was controlled by an application of silver nitrate solution 1 to 8, followed by applications of citron-juice as home treatment.

ZINC STERATE IN THE TREATMENT OF ATROPHIC RHINITIS.

Dr. J. F. Gibbs (*The Canada Lancet*, Vol. 27, No. 5). The plan of treatment consisted in cleansing the nose by antiseptic sprays and peroxid of hydrogen. After the crusts were thoroughly removed the membranes were covered with a thin layer of powdered sterate of zinc containing 25% of euophen. Very satisfactory results were obtained.

(The stimulating action of the medicament employed was no doubt due to the euophen, as this drug contains about 20% or more of iodine as one of its constituents. M. D. L.)

REMOVAL OF THE TONSILS BY THE WIRE SNARE.

Dr. Marcel, Bucharest, (*Indian Medical Gazette*, Vol. 30, No. 5). The author's conclusions are based on a series of fifty cases operated upon by the above method. He claims that the cold snare is (a) less likely to provoke fright in nervous children; (b) the instrument is less costly; (c) can be more readily cleansed, and is rendered non-aseptic, especially if a new wire is used for every operation; (d) the removal of the tonsil is more thoroughly effected.

(We strongly advocate the employment of the Mathieu tonsillotome as a better instrument, and one which will accomplish the desired result in a neater manner and in much less time than the snare requires. M. D. L.)

DISEASE OF THE MIDDLE TURBINATED WITH PUS IN THE ETHMOID CELLS.

Dr. George R. McDonagh (*The Canadian Practitioner*, Vol. 20, No. 5). In the experience of this observer the disease usually resulted from trauma or from extension from the nasal cavities. Granulations were frequently found with thickening of the anterior portions of the middle turbinated body. The probe revealed dead bone. Polypi formed from irritation of the mucous membrane. At the seat of granulation the bone may be found cleft with pus exuding. Headache, tightness over the bridge of the nose with neuralgia are some of the symptoms existing. Trans-illumination is an aid to the diagnosis. The inner half of the bone should be removed, and the ethmoid cavity cleansed with hydrozone or iodoform and glycerin.

COCAIN IN CHLOROFORM NARCOSIS.

Dr. Rosenberg (*Ibid*). At a meeting of the Berlin Medical Society the author advised the spraying of the nasal mucous membrane with a cocain solution (per cent not mentioned) before administering the chloroform. He states that by this treatment anesthesia is more rapidly effected, and reflex action on the heart is prevented. Cocain being an antidote to chloroform its absorption would probably lessen the danger of the latter.

ECCHONDROMA ARISING FROM NASAL BONE.

Dr. H. C. Barclay, Waimate, (*New Zealand Medical Journal*, Vol. 8, No. 1). The growth originated from the right nasal bone. It was noticed four years before the reporter saw his patient. History of increasing swelling. The young man was 27 years of age, and dated his trouble from knocks received while playing football. The tumor spread from the anterior to the posterior nares. Half of the nasal bone was involved in the growth, so same was removed with a bone forceps after an external incision was made. Perfect union resulted.

A CASE OF CONGENITAL ATRESIA OF THE NASO-PHARYNX.

Dr. C. B. Storrs (*Ontario Medical Journal*, Vol. III, No. 9). This anomaly was discovered in a female 7 months old. Mother noticed difficulty in breathing with loud wheezing and rattling.

On examining the anterior nares the author found the nostrils to be imperforate, the membrane extending entirely across them at the level of the inferior turbinated bone. No probe could be passed. Under anesthesia an incision was made, and the opening dilated with long dressing forceps. It was necessary to repeat the dilatation as the opening showed a tendency to close.

SADDLE-BACK NOSE.

Dr. L. A. Stimson (*Annals of Surgery*, Vol. 21, No. 6). In the case reported the deformity resulted from a broken nose. A canoe-shaped piece of aluminum five-eighths of an inch long was inserted between the skin and bones through a small incision on the ala, thus raising the bridge of the nose to its proper line. The wound healed nicely, but the outline of the nose was not exactly straight. The metal splint was replaced by a similar one of gutta percha about half as large again. The desired effect resulted.

(If these splints can be worn without exciting inflammatory changes the procedure is a valuable addition to nasal surgery. There is a wide field for cosmetic operations in this locality. M. D. L.)

PROFESSIONAL NEWS.

Dr. Casey A. Wood of our Editorial Staff has gone to Europe for a three months' vacation. Dr. Wood will visit a number of foreign Kliniks and attend the meeting of the Heidelberg Ophthalmological Society. When his wanderings are over we hope to profit by his added experiences abroad.

MARRIED.—We are pleased to announce the recent marriage of Dr. M. A. Goldstein of our staff of editorial collaborators to Miss Leonore Weiner, both of St. Louis. We extend our congratulations.

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BOOK NOTICES.

SKIASCOPY AND ITS PRACTICAL APPLICATION TO THE STUDY OF REFRACTION. By Edward Jackson, A. M., M. D., Professor of Diseases of the Eye in the Philadelphia Polyclinic, Surgeon to Wills Eye Hospital, etc., 8 Vo., 112 pages with twenty-six illustrations. Price \$1.00. The Edwards & Docker Co., Philadelphia.

Considering the wide practical value of the shadow-test it seems strange that this book or something of the kind has not been published before. As one method of objectively measuring refraction, some practical acquaintance with skiascopy is essential to every working ophthalmologist; and if as the author states, with a few days' practice the merest tyro may be able by it to estimate the refraction in favorable eyes with an accuracy not to be attained by any other objective method, it will certainly claim some attention from the "general practitioner" who wishes to know when a patient has an error of refraction that should be corrected.

It must be noted, however, that Dr. Jackson does not teach that skiascopy is to be mastered with a few days' practice. Of the first chapter a considerable portion is devoted to the difficulties of the test and suggestions as to how to study it. The remainder of this chapter is occupied with an account of its multitudinous names and its history. Succeeding chapters are given to General Optical Principles, Conditions of Accuracy, Regular Astigmatism, Aberration and Irregular Astigmatism, Practical Application with the Plane Mirror, Practical Application with the Concave Mirror, and General Considerations including Apparatus, Mydriatics and the Relative Advantages of the Plane and Concave Mirrors.

The work of the printers has been well done, type of good size, good paper, and substantial binding, all add to the appearance of the volume. The illustrations are nearly all original, the majority of them showing the appearance of light and shadow in the pupil in different conditions of refraction.

WILLS EYE HOSPITAL REPORTS, Vol. I., No. 1, January, 1895.
Published by the Editorial Committee of Wills Eye Hospital,
Philadelphia.

That Wills Hospital, with its 13,000 eye patients a year, furnishes the clinical material upon which can be based an extremely valuable series of hospital reports there can be no doubt, and the papers in the first number give the best indication that such a series is forthcoming. We find no indication of the intervals at which these parts are to appear; but considering that the one before us includes 136 octavo pages, with 25 illustrations, some of them colored, it seems hardly likely that they will be issued oftener than once in six months or a year.

Among the articles of special interest to the ophthalmologist we note a report of three cases of Cilia in the Anterior Chamber, by Dr. Geo. C. Harlan; one on Blepharoplastics, by Dr. P. D. Keyser; Clinical Methods and Memoranda, by Dr. H. E. Goodman; Acute Glaucoma from Atropia in a Child Twelve Years Old, by Dr. Frank Fisher; Clinical Cases, by Dr. C. A. Oliver; a case of Corneal Opacity Following the Use of a Lead Lotion, by Dr. S. D. Risley; and on the Limitation, Subsidence, and Disappearance of Opacity after Injury of the Crystalline Lens, by Drs. Edward Jackson and T. B. Schneideman.

Dr. Conrad Berens describes some new Blanks for Sketching the Ocular Fundus; Dr. Schwenk writes on Pediculiciliaris, and reports twenty cases; Drs. Zentmayer and Posey discuss the Comparative Value of Eserin and Iridectomy in Simple Glaucoma, basing their conclusions on 167 cases; and not the least in value are the reports of the Resident Physicians, Drs. Ellett, Parker and Curry, on the Cataract Operations and cases of Serious Injury of the Eyeball. An historical sketch of the institution by Dr. Berens, and a list of its medical and surgical officers from the time of its organization in 1833 to the present are included.

Of course the time has gone by when hospital reports, even the most valuable, could be the main dependence of the working ophthalmologist to keep him abreast of the progress of his specialty, but such as the one before us will prove a very valuable addition to every ophthalmic library.

A SYSTEM OF LEGAL MEDICINE. By Allen McLane Hamilton, M. D., Consulting Physician to the Insane Asylums of New York, etc., and Lawrence Godkin, Esq., of the New York Bar, with the collaboration of thirty of the most eminent medical and legal writers of the last years of the Nineteenth Century. To be completed in two volumes. Price, cloth, \$5.50 per volume; sheep, \$6.50 per volume. Published and for sale by E. B. Treat, 5 Cooper Union, New York, N. Y.

The first volume of this "System of Legal Medicine" is before us. It contains 657 pages. The first chapter is a scholarly introduction by Lawrence Godkin, Esq., in which definitions of legal

medicine and experts are given, followed by a review of the progress in legal medicine, etc. The other fourteen chapters are by learned collaborators, and are as follows:

1. Medico-Legal Inspections and Post-Mortem Examinations. By Algernon T. Bristow, M. D.
2. Death in its Medico-Legal Aspects. By Francis A. Harris, M. D.
3. Blood and other Stains—Hair. By Prof. James F. Babcock.
4. Identity of the Living. By Allan McLane Hamilton, M. D.
5. Identity and Survivorship. By Benjamin N. Cardozo, Esq.
6. Homicide and Wounds. By Lewis Balch, M. D.
7. Poisoning by Inorganic Substances. By Charles E. Pellew, Ph. D.
8. Poisoning by Alkaloids and Organic Substances. By Walter S. Haines, M. D.
9. The Toxicologic Importance of Ptomaines and other Putrefactive Products. By Victor C. Vaughan, M. D.
10. The Medical Jurisprudence of Life Insurance. By Brandreth Symonds, M. D.
11. Accident Insurance. By Cortlandt Field Bishop, Esq.
12. The Obligations of the Insured and the Insurer. By R. C. McMurtrie, Esq.
13. Of Certain Legal Relations of Physicians and Surgeons to their Patients and One Another. By William A. Purrington, Esq.
14. Indecent Assault Upon Children. By W. Travis Gibb, M. D.

Every chapter in this volume is well written, showing that each writer has a thorough understanding of his subject. The chapter on "Toxicologic Importance of Ptomaines and Other Putrefactive Products" by Victor C. Vaughan, M. D., is not as complete as the readers of the *ANNALS* might expect, as it is a very important subject, but the author has exercised great care in presenting the subject in a conservative and guarded manner, leaving nothing unexplained. This short chapter of eighteen pages, alone, is worth the price of the book to any well-informed physician, though every chapter will be helpful to the medical man who is likely to be called before courts of justice in these days when the people appear to be made for the courts, instead of the courts for the people.

This "System of Legal Medicine" should be in the library of every physician as the legal rules and forms elucidating questions relating to the cause or time of death, conception and birth, or the cause or effect upon the legal status of individuals of mental or physical disease or injuries are such that the physician will profit by reading them though he may never be so unfortunate as to be called into court as an expert. In these days of criticism and belittling of expert testimony no member of the medical profession

can afford to not acquire a thorough knowledge of all that relates to medical jurisprudence, as it is his learning and experience, drawn from the "myriad of single instances," which qualify the medical expert and gives his opinion in the specific instance in issue, gravity and weight.

THE YEAR-BOOK OF TREATMENT FOR 1895. A Comprehensive and Critical Review for Practitioners of Medicine and Surgery. In one 12mo volume of 501 pages. Cloth, \$1.50. Philadelphia: Lea Brothers & Co., 1895.

This issue of the *Year-Book* is equal, if not superior, to previous issues.

Its contents show that it is not intended to include everything new, but only a share of that which promises to be of permanent value to the therapist. The reviewer cannot help thinking that the value of the *Year-Book of Treatment* would be greatly enhanced by having it edited by an American, *e. g.*, Roberts Bartholow. Our English brethren do not appear to realize that such a book should take in more "territory" in order to make the *Year-Book* useful to all English reading physicians.

Contracted ideas retard the progress of rational therapeutics. The name of the editor does not appear, but the work has been done by twenty-three well-known English specialists.

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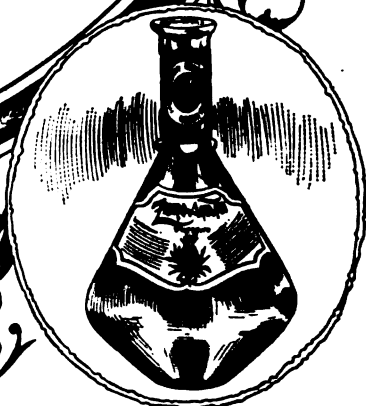
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SKIASCOPY

AND ITS

PRACTICAL APPLICATION TO THE STUDY OF REFRACTION.

By EDWARD JACKSON, A. M., M. D.

Professor of Diseases of the Eye in the Philadelphia Polyclinic, Surgeon to Wills' Eye Hospital, etc., etc.

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Skiascopy, the Shadow-Test, is recognized by all who have mastered it as the most important objective method of measuring refraction. This book gives the clearest, most complete, and most practical account of it yet published.

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- CHAPTER I.—History, Name, Difficulties and How to Study the Test.
- CHAPTER II.—General Optical Principles, Reversal, Real and Apparent Movement of Light. Rapidity of Movement, Form and Brilliancy of Light Area. The Point of Reversal.
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- CHAPTER IV.—Regular Astigmatism. Points of Reversal, Band-like Appearance. Changes with Distance. Direction of Band and Movements.
- CHAPTER V.—Aberration and Irregular Astigmatism. The Visual Zone. Symmetrical Aberration, Positive and Negative. Irregular Astigmatism. Conical Cornea. The Scissors Movement.
- CHAPTER VI.—Practical Application with Plane Mirror. Position and Arrangement of Light. H., E., M. Regular Astigmatism. Aberration and Irregular Astigmatism. Measurement of Accommodation.
- CHAPTER VII.—Practical Application with Concave Mirror. Position and Arrangement of Light. H., E., M. Regular Astigmatism. Aberration and Irregular Astigmatism. Measurement of Accommodation.
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No. 4.

IDENTICAL RETINAL IMPRESSIONS ON CORRESPONDING POINTS NOT NECESSARY FOR BINOCULAR SINGLE VISION.

BY F. B. EATON, M. D.,
OF PORTLAND, ORE.

PROFESSOR OF OPHTHALMOLOGY AND OTOLOGY MEDICAL DEPARTMENT
UNIVERSITY OF OREGON.

SEVERAL articles, some in favor, others opposing the theory of so-called compensatory action of the oblique muscles in oblique astigmatism, of which the late Dr. Culbertson¹ was the real father, would not, perhaps, repay perusal by most ophthalmologists, and refutation of the theory be of no practical importance, were not therapeutic measures founded upon it by its advocates, and some unreflecting readers influenced thereby. Arguments *pro* and *con*

¹ *Four. Amer. Med. Asso.*, November, 1888.

have been based upon photographic pictures made with the ordinary camera, the construction of which is similar in some respects to the form and mechanism of the eye,² but nevertheless differs strikingly in one regard not referred to by the writers of these articles, in that the ground glass on which the image is formed, unlike the retina, presents a flat instead of a concave spherical surface. I invite the attention of the advocates of the theory to this fact, which will probably explain the occurrence of binocular metamorphopsia in emmetropes when certain lenses are before the eyes.

“The phenomena (of metamorphopsia) are not rare, not even comparatively rare. On the contrary, they are to be seen in all cases of anisometropia with binocular single vision, with exceptions. * * * The existence of astigmatic defect is not a *sine qua non*, although the phenomena are especially noticeable in cases of astigmatism of one or both eyes, in which the chief meridians are oblique.”

Even some of the evidence adduced in favor of the theory affords proof of its falsity. Thus the photographs, Nos. 3 and 5, of a rectangle as seen by a cylinder with its axis vertical and horizontal and illustrating the paper of Dr. J. B. Lowry,⁴ show unmistakable distortion of the vertical sides of the image.

But beyond and superior to the above-quoted reasons for giving no practical weight to the persistent and forced advocacy of this untenable theory, is that contained in the following passages in Hering's *Lehre vom Binocularen Sehen*. I commend it to those who fancy they see in the images produced by oblique-angled cylinders, as seen in the camera, an analogy to those formed on the retina in oblique astigmatism as seen by the brain, for we do not see in reality with the eye, but with the brain:

“The physical laws, according to which the images of objects lying excentrically are projected upon both retinæ, necessarily involve the fact that binocular single vision cannot be connected with identical impressions on corresponding points of both retinæ. If this were the case, only those points in the

² *Four. Ophth., Otol. and Laryn.*, 1895. *Ophth. Record*, August, 1895.

³ *Archiv. Ophth.*, Vol. XVIII.

⁴ *Ophth. Record*, August, 1895.

visual field could be seen singly, which lie in certain lines and surfaces through the point of fixation. But this contradicts common experience and the results of more exact physiological investigation, and it is especially disproved by the optical effect of the stereoscope. We can only say that binocular single vision of corresponding portions of the two retinæ actually occurs, that it is to some extent obligatory, since no kind of practice, or artificial assistance, renders it possible to see the two simultaneous irritations of such points at the same time, separated, near or behind each other. We may also say that the power of the single sensation extends to *different* parts of both retinæ, and may here be called *facultative*, since practice and all kinds of artificial assistance cause an object originally seen single to appear separated into two false images. Still more, single vision with disconsonant retinal positions is one of the requirements for the solid vision of objects.⁵'''

To the present champion of the new theory, whose elaborate diagrams of the retinal images in oblique astigmatism appear to be the *points de resistance* of his theoretical edifice, the above quotation is especially commended.

⁵ *Die Lehre vom Binocularen Sehen.*, Leipzig, 1868.

WHICH NERVES GIVE RISE TO THE SENSATION OF PHOTOPHOBIA?

BY H. GRADLE, M. D.,
OF CHICAGO.

THE following accidental observation proves that the sensory nerves of the cornea can be influenced by light under some circumstances, and that their irritation by light can cause photophobia:

Dr. B. became blind in the left eye during childhood, in consequence of a blow. An examination made in the course of our acquaintance showed white atrophy of the optic nerve with total loss of sight. The pupil reacted consensually with the other, but was wide and immovable on closing the normal right eye. During the month of October Dr. B. suffered of a circumscribed keratitis of the left blind eye, for which no cause could be found. It improved rapidly under the use of atropin, and he paid little attention to it. But in December there developed a small shallow ulcer, with gray floor, in the lower part of the still hazy cornea, which caused him more acute annoyance. The subsequent history is of no further interest, as the disease healed in about three weeks.

During the time of acute irritation, Dr. B. stated that the *blind eye was sensitive to light*. It presented the usual appearances of ciliary irritation, viz., ciliary injection, watering and partial closure of the upper lid. This partial ptosis, due no doubt to a reflex tonic contraction of the orbicularis muscle, was distinctly increased on exposing the eye to light, and lessened by relative darkness. This result was not changed by closing the other eye with a dark bandage. Moreover, Dr. B. *could tell promptly whenever I threw light into the blind eye* by means of a mirror in the dark room, the other eye being of course excluded. The sensation due to light was one of increased discomfort, not easily described in words, with tendency to shut the eye. There was neither a sensation of light nor of warmth. After the disease had healed the eye was entirely unconscious of light thrown into it.

The observation proves that the sensation of photophobia can be induced by sensory nerves without activity of the optic nerve. That the nerve fibers involved are those of the cornea is most probable in view of the paucity of sensory fibers in the other ocular tissues. Moreover, it is in diseases of the cornea that we witness photophobia more strikingly than in any affection localized in other structures. The rôle of the corneal nerves in photophobia is also shown by the decided relief following the instillation of cocain. It is true that it is only under pathological conditions that these sensory nerves react to light by inducing a sensation of discomfort and a reflex contraction of the lid-closing muscle. But we see similarly that the nerves of the skin, periosteum and other tissues react to the stimulus of slight pressure by pain only when inflamed, while when normal the same stimulus is either not felt at all or merely in a painless form.

Our observation, however, does not prove that photophobia may not also be induced through the optic nerve. It is probable that the distress to which light can give rise in some diseases, and under some circumstances even in health, is conveyed through several nerve channels. The healthy eye cannot be exposed to strong and especially flickering light, after long sojourn in the dark, without the discomfort which we call dazzling. Sensitiveness to light of a similar character, even in ordinary daylight, is complained of also by some patients with uncorrected refractive errors, but healthy eyes. Again, in incipient choroiditis we find some patients suffering, even of headache, when exposed to ordinary light. In all these instances physiologic analysis favors the conclusion that the dazzling results from an unusually inactivity of the optic nerve fibers.

It would be interesting to study the occurrence of photophobia in patients with anesthesia of the fifth nerve. In two instances of keratitis following herpes zoster I noticed—one slight, in the other patient pronounced—photophobia. But in neither patient was there total loss of sensitiveness—only partial anesthesia of cornea and conjunctiva.

THE IRIS, AS DIAPHRAGM AND PHOTOSTAT.*

BY CHAS. F. PRENTICE, M. E.,
OF NEW YORK.

UNDER this title it is proposed to inquire into the value of sub-decimals of the diopter-lens in ametropia. The subject was discussed at considerable length, at a meeting of the American Medical Association, in San Francisco, Cal., 1894, with the result that "low degree lenses" were generally conceded to have a beneficial effect in some cases of ocular refraction, but, so far as I have been able to ascertain, from a perusal of supporting opinions, the considerations here presented were not touched upon in the arguments advanced.

In every compound lenticular system we are met with the necessity of providing against spherical aberration. This is accomplished, in the construction of optical instruments, by introducing an annular disk, of *calculated* diameter, known as the *diaphragm*, which is suitably placed between the lenses to exclude peripheral rays. If the proper diaphragm be replaced by one of smaller aperture, we increase the definition, but diminish the extent of field and illumination. A larger aperture will increase illumination and field, but definition will be impaired, on account of the aberration thus allowed.

The aperture of the diaphragm must therefore have a definite and specific diameter for every optical instrument, if we are to secure *maximum* definition and illumination, *without aberration*. The proper diaphragm is therefore one of the most important and indispensable parts of every compound dioptric system. The human eye is such a system, and is

*Photostat Greek, φῶς (φωτ-), light, + στατός, verbal adjective of ἰσθάναι, stand—an automatic light regulator.

provided with its diaphragm—the iris. In the eye, which is a dynamic apparatus given to variations of power, a fixed diameter of pupil would fail to theoretically fulfill the requirements. When the eye is in a state of accommodation, it becomes a stronger refracting system, and therefore needs a smaller aperture of diaphragm; hence the pupil contracts.¹ Yet, Helmholtz² says: “A. von Graefe observed in an eye from which he had removed the iris by operation that the normal range of accommodation was still present, and also that the changes in the anterior curvature of the lens could still be observed.” He concludes: “The iris does, therefore, not play an important rôle in accommodation.” (Lit. trans.) Landolt³ expresses the same opinion. So far as the above noted measurements are concerned, such conclusion may be quite correct, yet, if construed in its broadest sense, it discountenances the value of the iris as a diaphragm entirely.

It is, nevertheless, universally admitted that the iris does act independently of, and simultaneously with accommodation.⁴ When acting independently of accommodation, the iris is known to behave as a highly sensitive *photostat*, though regulating the volume of light upon the retina to such a degree as shall be most agreeable to our light-perceptive sense.

A most subtle and synchronous balance, between retinal perception, uveal stimulus, and iritic response, must therefore exist, if the iris is to perform its functions simultaneously as diaphragm and photostat.

An endeavor will here be made to support the hypothesis that *a disturbed equilibrium of these functions is probably the cause of asthenopia in low degrees of ametropia*. From a strictly optical point of view, every eye of the same refrac-

¹In fact, it was at one time supposed that contraction of the pupil was the only means by which the eye adapted itself for near vision. Helmholtz, *Physiologische Optik*, page 161, Hamburg and Leipzig, 1886.

²Helmholtz, *Physiologische Optik*, page 138.

³Landoldt, *Refraction and Accommodation of the Eye*, page 164, Philadelphia, 1886.

⁴“Movements of the iris are nevertheless associated with accommodation; they are governed by the same nerves as the latter, so that, until the mechanism of accommodation is better understood, a direct relation between them may not be looked upon as being improbable” (lit. trans.) Donders, *Refraction and Accommodation*, page 485, Wien, 1866.

tion, other things being equal, should have a pupil of the same diameter—one suited, by *calculation*, to exclude peripheral aberration, while securing the greatest tolerable illumination. This, however, is not known to be the case, nor have I found that any one has ever calculated what the diameter of the pupil should be for any given schematic eye. Listing has calculated a table showing the changes in diameter of the diffusion circles upon the retina which arise through efforts of accommodation in a schematic eye having a pupil of 4 mm.⁵

We have thus far been content to know that pupils differ in size in different persons. There must, however, be a *limit* to the maximum diameter of the pupil, if aberration is to be excluded, and if, *for any reason*, the pupil is prevented from contracting to at least this limit, we shall have aberration, even in the emmetropic eye.

This is *exaggeratedly* shown in Fig. 1, in which the central incident rays, *cc*, focus at *f* upon the retina, while the

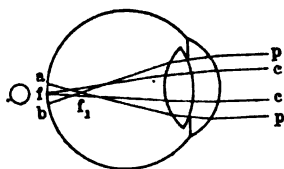


FIG. 1.

peripheral rays, *pp*, produce thereon an area of diffusion,⁶ *ab*, and which to all practical purposes, would be equally as effective in impairing vision as a low degree of myopia, having its intra-ocular focus between the retina and *f*₁. In fact, it is questionable whether the eye can discriminate between images which are impaired by peripheral aberration and those which are illy defined from slight errors of refraction. The following experiment will serve to illustrate this: By placing a 1 D. convex lens before the emmetropic eye, it is practically rendered myopic for distance, the letters of the test-card at 6 m. becoming indistinct, with a probable reduc-

⁵ Helmholtz, *Physiologische Optik*, page 127.

⁶ For purposes of lucid illustration, the diffusion areas in all of the diagrams are greatly exaggerated.

tion in the visual acuteness to say $\frac{1}{2}$. If the lens be now covered with a pin-hole disk, normal acuteness of vision will be re-established, with no other appreciable difference than that the field and illumination are less. We may therefore consider the peripheral rays, here accompanying the increased refraction, as aberrative rays in respect to the enclosed central incident beam, so that an eye capable of contracting its pupil to the same extent would, in part, similarly correct its error of refraction.

This is undoubtedly one reason why errors of refraction of the same degree are not accompanied by the same diminution of visual acuteness. The myope of 1 D., with small pupils, *without* glasses, will probably have better vision than the myope of 1 D. with much larger pupils. Within certain limits, peripheral aberration and anomalies of refraction are analagous in destroying definition of the image. A slight error of refraction, with large pupils, may produce diffusion images equally as pronounced as a considerable refractive error with small pupils. *Asthenopia is therefore quite as apt to be experienced on account of the size of the pupil, as it is on account of the error of refraction.* This should explain why it is that many persons, having small pupils, endure a considerable error of refraction without inconvenience, while others, with large pupils and small errors of refraction, are afflicted with asthenopia.

Again reverting to Fig. 1, the larger the pupil, the greater will be the zone of peripheral aberration and its correlated diffusion-area, *ab*. In fact "the peripheral aberration upon the optical axis is known to increase, not only in proportion to the square of the aperture, but, also *pari passu* with the refraction" (physical law), so that we should have greater diffusion circles upon the retina, when the ciliary muscle is brought into action, even in emmetropia, to correct the peripheral aberration which impairs the sharp definition at *f*. The only stimulus which could assist in correcting the aberration in this case would be that which, imparted to the iris from the retina, would cause the pupil to contract sufficiently to exclude peripheral rays. In here speaking of the retina, we of course take for granted its highest state of physio-

logical development. The question then arises: Is such retinal stimulus imparted to the iris in low degrees of ametropia, *independent of accommodation, without increased light intensity?* If there is such independent action on the part of the iris, ineffectual efforts of the ciliary muscle to correct impaired vision may be followed by a contraction of the pupil necessary to shut out the peripheral rays. As to this, let us investigate the relation which should exist between the iris and accommodation in the hyperopic eye.

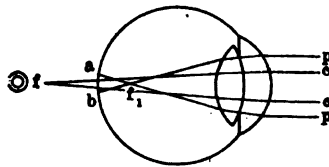


FIG. 2.

In this, Fig. 2, the central rays, *cc*, are focused behind the retina at *f*, the peripheral rays crossing at *f*₁, and producing the diffusion-area *ab*. In facultative hyperopia there will be accommodation sufficient to bring *f* forward to the retina. With this increased refraction, however, the pupil remaining the same, *f*₁ will recede from the retina, with a corresponding increase in the size of the diffusion-area, *ab*⁷. It is therefore

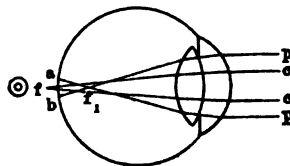


FIG. 3.

evident that, if *increased* aberration is to be avoided, a *normal* pupil must contract concurrently with the accommodation. This, generally speaking, is known to be the case. If, as in Fig. 3, the hyperopia is of low degree, with *excessively* large pupil, we shall have a comparatively small central area of diffusion, due to the refractive error, covered by a much larger area of diffusion and illumination, *ab*. The slightest effort of accom-

⁷ Listing's table shows that the diffusion circles upon the retina increase more rapidly as the object approaches the eye at short range. Helmholtz, *Physiologische Optik*, page 128.

modation would tend to sustain, or increase this discrepancy. It therefore follows, if the aberration is to be abolished, that the iris must receive an increased stimulus to bring about a contraction of the pupil, *in excess of that which is concurrently associated with accommodation, and that, too, for every degree of light intensity.* Were this not the case, vision, at a distance,⁸ with excessively large pupils, would be impaired by aberration under all circumstances.

The additional stimulus to contraction is undoubtedly due to the *increased area of illumination* above mentioned. This would seem to imply that the contraction of the pupil not only responds to the light intensity (quality), but also to its area (quantity) upon the retina.

It is also evident that the impairment of vision should be ascribed to that factor causing the largest area of diffusion upon the retina. The larger the pupil, the more will the peripheral aberration predominate over that which is produced in the center by a low degree of refractive error.

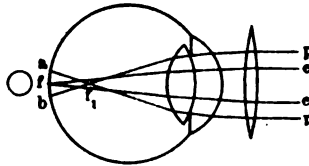


FIG. 4.

By placing the lens before the eye which corrects the hyperopia we increase the refraction, thus eliminating the diffuse central image, but at the same time increasing the peripheral aberration, and therefore also the *area of illumination*, Fig. 4. If the pupil contracted only in *proportion* to the consequent increased light stimulus there would still remain the original diameter of diffusion area. As, however, correction of the refractive error by the lens improves vision, and relieves asthenopia, being *tacit proof* that the aberration is dispelled, it is evident that the pupil must contract *more than*

⁸ In accommodation, with a standard light placed behind the plane of the eyes, and an approach to them of the paper upon which the test-type is printed, the illumination upon the paper increases in the inverse proportion to the square of the reduced distance between the light source and the test-object. The illumination also varies directly as the cosine of the angle of incidence upon the illuminated surface. (Physical Law of Photometry.)

in proportion to the aforesaid light stimulus. Is it not then probable that the pupil contracts *more freely* when accommodation is relaxed?

In controverting this, it would be necessary to refute the following fact pertaining to combined kinetic energies:

When accommodation is in force, the iris is known to be carried forward,⁹ by pressure from the anterior surface of the lens, which has become more strongly curved. Such lens pressure, *the iris remaining inactive*, would tend to increase the diameter of the pupil. On this account, greater efforts of the sphincter will be necessary to counteract this action of the lens-surface, when accommodation is present, Fig. 5, than it would with relaxed accommodation, Fig. 6.

For *normal* conditions of innervation the sphincter is known to more than overcome such action on the part of the



FIG. 5.



FIG. 6.

lens in accommodation, Fig. 5. If, therefore, our hypothesis is correct, we have found a reason why low degree lenses are of so much benefit in slight hyperopia, and congenic astigmatism. Furthermore, we are justified in assuming that the sphincter in large pupils does not always adequately respond, *while accommodation is in force*, especially in cases where the optical error is so slight as a quarter diopter, from the fact that, in the majority of such cases, the patients are young, and often possess amplitudes of accommodation varying between 6 and 14 diopters.

Patients with such accommodation have so much of it in reserve, even when using the eyes in proximity, that their asthenopia can scarcely be ascribed to an overtaxed ciliary muscle. Are we not then justified in attributing it to possible

⁹ Helmholtz, *Physiologische Optik*, page 131, Wien, 1886.

fatigue of the iris, resulting from its involuntarily prompted, though futile, efforts to exclude peripheral aberration, because of the sphincter's inability, *for some reason*, to contract sufficiently?

It is not recorded that a disproportion of the pupils to the dioptric system of the eyes does ever exist physiologically, but there are many conditions of the nervous system which produce immoderate dilatation of the pupils. Such dilatation, *while it lasted*, would tend to oppose the normal association between refraction and the correlated size of the pupil.

In those cases of *normal* pupil, where the perceptive qualities of the retina are good, and the error of refraction is slight, retinal stimulus will prompt contraction of the pupil sufficient to exclude aberration. Is it not probable that, in some cases with *large* pupils, protracted efforts of this kind would result in fatigue of the iris? Might not prolonged ineffectual efforts of the iris to regain equilibrium between its functions, as diaphragm and photostat, account for asthenopia? Or, to put it in another way: Could not that prolonged effort of the sphincter, which would have to be *in excess* of the normal qualitative and quantitative light stimulus, to correct aberration, produce asthenopia?

It need not follow that the iris is incapable of temporarily contracting even to a greater extent than is necessary for the above purpose. This is demonstrated by the extreme contraction of which the pupil is generally capable when exposed to intense light, and the eye is in its static state of refraction.

In hyperopes, we generally ascribe the cause of asthenopia to fatigue of the ciliary muscle, owing to its efforts to exclude the error of refraction by accommodation. The same can not be said of myopes, whose use of accommodation for such purpose would only render them deplorably more myopic. Their asthenopia can certainly not be ascribed to ciliary fatigue. Some myopes, however, endeavor to improve their vision by compressing the eyelids, which means that they thereby *modify the pupils* to exclude peripheral rays, and the aberration which is heightened by the myopia. In low degrees of myopia and congeneric astigmatism, however, modification of the pupils, by compression of the eyelids, is not sufficiently

delicate to exclude aberration, *without too great a sacrifice of illumination*. Such patients are therefore more apt to apply for relief from glasses, than those who help themselves by compression of the eyelids, provided this is unaccompanied by asthenopia. In the former cases, we are to suspect that the relief sought is: *freedom from peripheral aberration*. The latter also aggravates *photophobia*, which is a symptom frequently complained of in such cases.

The improvement in vision, which the myope, of low degree, with large pupils, secures by the lenticular correction, is practically due to the fact that the peripheral aberration is decreased, through reduced refraction obtained by the concave lens in front, Fig. 7.

The rays, emitted from the concave lens, enter the pupil with a divergence counteracting the excessive convergence of

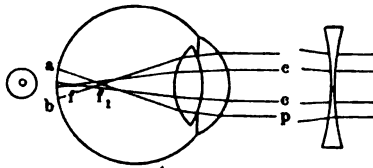


FIG. 7.

the rays which are imperfectly focused by the crystalline on the retina behind f . The peripheral diffusion area, ab , may not, however, always be in such proportion to the central diffusion area as to be fully corrected by the lens which corrects the refractive error in the center. Should it, in the case of a larger pupil, be greater, the patient would merely then select a stronger lens, having its proper effect upon peripheral rays, while its tendency would also be to over-correct the myopia. For a low degree of myopia this would scarcely be appreciable, since very little difference is experienced in the actual centers between lenses of a quarter and a half diopter.

In those cases where the quarter-diopter lens seems to relieve distress it will generally be found that the pupils are comparatively large. This is especially noteworthy in those cases where simple myopes of low degree are benefited by wearing their weak distance corrections for *reading*, and which can serve no other *needful* purpose than to eliminate peripheral aberration.

So far, we have no means of ascertaining the size, or that variation of the pupil which is necessary to establish the proper harmony between refraction, accommodation, illumination, and freedom from aberration. The intuitive discrimination, which accompanies experience, is at present our only guide.

In refractive errors of low degree, which are relieved by lenticular correction, the retinal perception is usually also very keen, thus increasing stimulus to contraction of the sphincter, while the correction in such cases frequently improves vision to $\frac{5}{8}$, which is far above normal.

The larger the pupil, the more pronounced will be the improvement in visual acuteness obtained by low-degree corrections. The quarter-diopter lens rarely proves of benefit when the pupils are small.

Again, patients frequently wear such glasses for a time, relieving their asthenopia, and ultimately lay them aside, without feeling the necessity of their further use. Examination will nevertheless reveal the fact that *the optical error has not changed*. Why then should asthenopia exist at one time, and not at another, for an *invariable* hypermetropic astigmatism for instance, if the fatigue in the first instance had only been due to that of the ciliary muscle?

Closer examination, however, will frequently show that the pupils appear to be smaller at the time the patient has discarded his glasses, than when they were prescribed. The pupil being the only member seeming to have undergone a change, are we not justified in suspecting the iris, by reason of disturbed innervation, as having been at least implicated in the cause of asthenopia?

REMOVAL OF THE SUPERIOR MAXILLARY BONE
FOR SARCOMA, INVOLVING THE CEREBRAL
AND ORBITAL CAVITIES AND THE
ANTRUM OF HIGHMORE.

BY WALTER B. JOHNSON, M. D.,
OF PATERSON, N. J.

A. H., 10 years of age, female, born in England. On September 4, 1893, applied for treatment at the Paterson Eye and Ear Infirmary, with the following history:

Her father died seven years ago from unknown causes, being away from home at the time. Her mother is in good health; although not a robust woman, she has been able to work and support her family. She states that she never heard of any malignant diseases or growths in any of the members of either her own or the father's family.

The patient has always been a strong, healthy child, never having had any illness except the diseases of childhood, all of which she had when very young, and after which none of the common sequelæ were developed. On the 8th of August, twenty-six days ago, she was struck on the right side of her face by an opening gate, and states that although she was not struck in the eye she had pain in it immediately after the accident, which continued to increase in intensity each day, there was no cut or bruise about the face or head. The mother states that the child did not complain of pain until three days after the injury, at which time she noticed that the right eye was somewhat prominent; that there was redness about the conjunctiva and considerable lachrymation. The prominence of the eyeball steadily and quite rapidly increased from the time when it was first observed; there was some

photophobia, she has constantly suffered from headache, frequently of sickness of the stomach, and has been very drowsy and somewhat stupid. She has had some fever and for the past two weeks her tongue has been coated and her lips and mouth dry, her bowels have been kept regular, moving each day, there has never been any purulent discharge from the eye.

September 4, 1893. On examination the patient complains of severe headache, and considerable pain in the eye, especially when it is uncovered, her tongue is coated and her mouth dry; pulse 108; she is excitable and nervous. The mother states that the prominence of the eyeball has markedly increased during the past two days. The right eyeball is extremely prominent, being fully one-half inch in front of the plane of the fellow eye and displaced downward, forward and outward. The patient, on making a special effort, can close the lids and completely cover the eyeball. The pupil is responsive to light, and about the same size as that of the fellow eye. The mobility of the eyeball is very much impaired, especially outward, inward and upward; behind and to the nasal side of the eyeball is a tumefaction which is somewhat resilient. The appearance of the face and probable size of the growth when first seen is illustrated by the upper section, No. 1, of plate No. 1. R. E. V. = fingers at 2 feet; L. E. V. = $\frac{1}{2}$ ft.

Ophthalmoscopic examination: The right fundus shows a very hazy optic disc, the retinal arteries and their branches are reduced to about one half their normal size, the veins are very much engorged and are distended, they are about twice their normal size, somewhat tortuous and very dark colored.

September 9. The patient has grown steadily worse, as shown by the decided increase in the prominence of the eyeball, Plate No. 1, Section No. 2. The mobility of the eyeball is still more impaired, only slight motion inward, downward and upward remaining. R. E. V. = fingers at 6 inches. The right nasal cavity is completely filled with new tissue, it is entirely closed and permits neither expiration or inspiration, there is a welling out of pus from the puncta lachrymalis on pressure, also a profuse discharge of thick, creamy pus from the nose. The patient was referred to the Manhattan Eye and Ear Infirmary for diagnosis. The following reply was

received from Dr. A. E. Adams: "I am inclined to think the case one of sarcoma, it may be osteoma periostitis, etc. In any case, I should say the only thing to do is to remove."

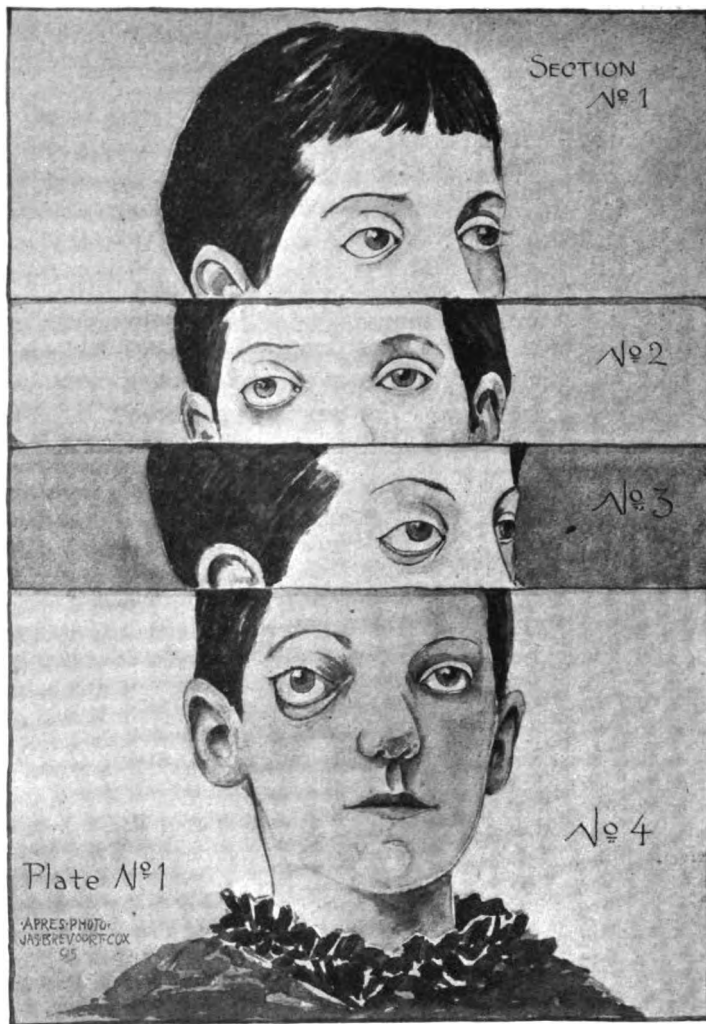


PLATE NO. 1.

it, if possible. I have asked Dr. Lewis to look at the case, and he agrees with me in the main."

September 12. The growth has continued to increase rapidly, its size is indicated on Section No. 3, of Plate, No. 1. The case was referred to Dr. H. Knapp, with the following

letter: "The bearer of this note, a patient of the Paterson Eye and Ear Infirmary, I send to you for your opinion. I would be pleased if you would also state what you think regarding the possibility of success in operating for its removal. You will notice that it extends to the right nasal cavity. It has grown to its present size since Monday, September 4, when the enclosed photo was taken."

The case was examined at the Ophthalmic and Aural Institute by Alexander Duane, M. D., who wrote as follows:

"Writing in place of Dr. Knapp, who is absent, I would say that examination points to suppuration from the ethmoid region (the right nasal fossa full of pus); the indication being to make an incision and explore to evacuate matter. Case examined by Dr. Born and myself for the eye and by Dr. Tocplitz for the throat. I would be glad to hear what you find in case you operate. The diagnosis in these cases is always rather problematical, and all such cases are instructive."

September 13. The patient was placed under ether and an examination made; it was positively determined that the diagnosis was some variety of new growth which fully occupied the right nasal cavity, as it also did the right orbital cavity. An hypodermic needle was introduced into the orbital cavity, well behind the eyeball, and some blood withdrawn, there was no evidence of the presence of pus. A small portion of the growth was removed from the nasal cavity for microscopical examination and submitted to Dr. Joseph W. Williams, who reported as follows:

"I have examined the specimen taken from the nasal cavity of Annie Hill and find it to be a sarcoma of the small, round-celled type. The cells are in great profusion, composing almost all of the diseased material. There is only a very small portion of fibrous tissue in the new formation. The growth is undoubtedly of a very malignant nature."

September 21. The protrusion of the eyeball has increased very much during the past three or four days. There is marked conjunctival chemosis, as shown on Section No. 4, of Plate No. 1, taken September 20. It was decided that an effort at the removal of the growth, which it was then believed originated in the antrum, should be undertaken. The patient

was etherized, a tracheotomy performed and the fauces plugged with a cotton tampon. An incision was then made from the temporal side of the upper eyelid, just under the brow, around the inner canthus, down the side of the nose, around the allæ to and through the center of the lip. The flap thus formed was dissected back, exposing the superior maxillary and malar bones, the eyeball and the new growth.

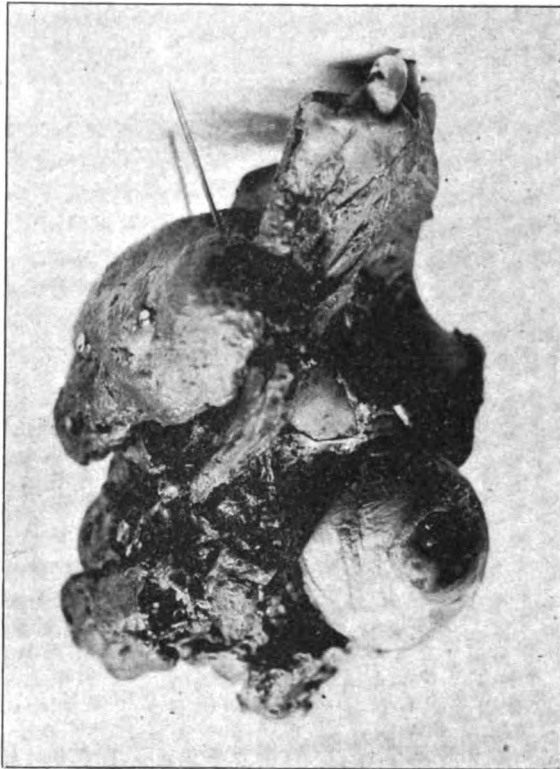


PLATE NO. 2.

In removing the flap, the conjunctiva was dissected from the eyeball carefully and cut close to the limbus cornea. Saw cuts were made through the hard palate and through the malar bone, and the bone loosened, careful dissection was made backward and inward, and the mass shown, in Plate No. 2, removed. Care being taken to leave the soft palate intact. The mass consists of the right half of the superior maxillary

bone, the eyeball and the new growth, which was contained in the orbital, nasal and cerebral cavities and the antrum of Highmore. The foci of the new tissue formation was apparently the ethmoid bone, which was softened, diseased and enveloped in the new growth. The involvement of the other cavities was undoubtedly secondary. The bone and new material was removed and the dura mater exposed. There was discharged from the cerebral cavity some thick, yellowish pus. The dura mater did not appear to be involved. The condition of the patient was such as a result of shock and hemorrhage that hypodermics of brandy and injections of saline solution were necessary to prevent fatal collapse. The cavity was packed with iodoform gauze and the flaps sutured.

September 22. The patient passed a satisfactory night, complained of no pain and took some nourishment. Morning temperature, 102° ; pulse, 140. Evening temperature, 104° ; pulse, 140.

September 23. The tracheotomy tube was removed. The patient is taking ample quantities of nourishment, but had developed some delirium during the night and complained of soreness of the muscles of the neck and back, and cried out when moved. There were occasional semi-convulsive seizures, with a contraction of the muscles, producing opisthotonos.

September 25. The patient complains of no pain in the wound, and is in better condition, although the delirium persists, and she had, during the night, disturbed the dressings and picked out some of the sutures.

September 27. The delirium was not so marked during the night, the patient is more comfortable and takes large quantities of milk.

September 29. The patient is perfectly rational. All symptoms, except rise of temperature each evening, have disappeared. The temperature during the week has ranged from 102° to 105° .

October 1. There is still slightly increased temperature each evening, the patient is comfortable and does not complain.

October 25. Since last record, twenty-five days ago, the patient has been cheerful and happy, rarely complaining, even when the wound was dressed. The temperature has been

constantly slightly above normal, the external wound is completely united, the cavity is granulating; there has been a constant and very considerable discharge of purulent secretion from it; there is no apparent return of the growth. The patient has taken large quantities of liquid nourishment, but has never, since the operation, regained her strength, and has lost flesh constantly, until at the present time she is extremely emaciated.

October 26. The temperature again rose, varied from 102° to 105½° during the day, and the patient developed an active delirium during the night. The symptoms persisted during the week following, during which time the patient grew constantly weaker and more emaciated.

November 2. She passed quietly away, forty-two days after the operation.

An autopsy made twelve hours after death disclosed in the cerebral cavity a considerable quantity of new tissue formation, making pressure on the anterior cerebral lobes. The new growth had involved the dura mater, and there was in the cerebral cavity some purulent secretion, the product of marked inflammatory action upon the cerebral membranes. The brain tissue was healthy. There was no tumor tissue re-formed at the seat of the operation.

The interesting features in the case are the uncertainties which presented themselves regarding the diagnosis, the exciting cause of the trouble being due apparently to an injury which occurred coincidently with the onset of the disease. The constitutional disturbance seemingly indicated the presence of periosteal inflammation as a result of possible injury, as did also the extremely rapid development which followed the first appearance of the ocular prominence.

TRAUMATIC PARALYSIS OF THE EXTERNAL RECTUS.

BY WM. E. BRUNER, A. M., M. D.,
OF CLEVELAND, OHIO.

CLINICAL ASSISTANT IN OPHTHALMOLOGY, DISPENSARY OF WESTERN
RESERVE MEDICAL COLLEGE, AND ASSISTANT IN CHARGE
OF EYE CLINIC, ST. VINCENT HOSPITAL.

IN the *Archives of Ophthalmology*, Vol. XXIII, page 361, Dr. Purtscher, in a somewhat extended discussion of traumatic paralysis of the abducens nerve, reviews the literature of the subject consisting of forty-six cases. In the same number, Dr. Friedenwald adds eleven additional cases—ten reported by other persons and one from his own observation. In the last number of the same journal, Dr. Zimmerman¹ adds two more cases, one described by Prof. Eulenburg and one from his own practice. To these fifty-nine cases, I should like to add one more, which I have had under observation for several months:

M. F., 32 years of age, consulted me May 28, 1895, with the history that six weeks before, while he was working in the large steel mills in this city, his head was caught between two carriages. There was bleeding from the nose and from both ears, he says, at the time of the accident, and the right ear continued to bleed at intervals for a week. Blood would come from the ears when he swallowed. He was not rendered unconscious, though he says he felt sleepy, but could not sleep on account of the pain. This was general at first, but soon became localized to the right temple, and continued,

¹ *Archiv. Ophthalm.*, Vol. XXIV., p. 248.

though gradually lessening, for five or six weeks. He was confined in a hospital for two weeks. Ever since the accident, he says that he has been "seeing double."

Examination revealed vision normal in each eye, but a little more acute in the left. Accommodation, Jaeger No. 1, pp. O. D. 25 cm.; O. S. 23 cm. Pupils were unequal, the right being the larger, and both responded readily to light and in accommodation. The diplopia which is present when he looks directly before him increases as he looks toward the right, but disappears as he turns his eyes to the left. A limitation of the movement of O. D. outwards is readily detected. The homonomous diplopia which results when a red glass is placed before one eye is overcome by a prism 22°, base out.

Ophthalmoscopic examination: O. S. media clear, disc round, with physiological excavation, slight disturbance of choroid surrounding the disc, and semi-atrophic crescent up and in. Disc is normal in color and the vessels are normal. O. D., similar condition exists except that the outer half of the disc appears slightly paler than the inner half. Vessels are normal.

Perimetric measurement showed the form field normal in the right eye, and the color fields slightly contracted for red and blue, especially upon the nasal side. Both form and color fields in the left eye were of full extent.

Dr. H. S. Straight kindly examined the ears for me, and gave the following report: "In the right ear there is a depression of the membrane in front of the handle of the *malleus*, and an old perforation, which had healed, in the anterior-inferior quadrant. In the left ear the membrane presented a ground-glass appearance, with no light spot. There is no indication of a perforation. Hearing distance with the left ear was 30 inches; with the right, 2 inches. Heard worse after inflation. In the nose there is a slight deviation of the septum to the left, but otherwise it is normal. Pharynx and naso-pharynx are normal."

He was given absorbent and alterative treatment consisting of bichlorid of mercury and iodid of potassium. His condition gradually improved, and when he was examined, June 14, he no longer had diplopia when looking straight forward, but

only when he turned the eyes to the right. He was then at work and was annoyed very little by the double vision. With the red glass before one eye, homonomous diplopia was still present, but was overcome by prism 10° base *out*.

On August 14, I examined him again. He was then no longer troubled at all with diplopia, and it could not be developed, not even with red glass, except at the extreme right of the binocular field of vision. With the Maddox rod there was esophoria 3° . The eyes now give him no trouble whatever. Vision, O. D. $\frac{5}{8}$ partly, O. S. $\frac{5}{8}$. Accommodation, Jaeger No. 1, pp. O. D. 24 cm., O. S. 21 cm. The right pupil is very slightly larger than the left, but is otherwise normal. The right optic nerve is still a little paler than the left on the temporal side, but the vessels are normal. There is now not the slightest contraction of the color fields. Hearing in the right ear seems to have decreased so that he now hears only in contact.

This patient, from all indications, had sustained a fracture at the base of the skull, involving probably a part of the petrous portion of the temporal bone, and the paralysis of the abducens was due not to any laceration of the nerve, but rather to a hemorrhage. As this became absorbed, the function of the nerve returned.

282 Prospect street.

A CASE OF SYMPATHETIC OPHTHALMIA FROM
IRIDECTOMY.BY SAMUEL L. LEDBETTER, M. D.,
OF BIRMINGHAM, ALA.

THE patient, a young girl, about 17 years of age, was brought to me by her father, February, 1894. She had cataract in both eyes. Complete in the right, incomplete in the left. Perception of light in the right, counted fingers at short distance with left. The cataract was soft and of general nature, coming on without any assignable cause. The patient's general health was good. I advised the needling operation, which was agreed to, and began at once with the right eye. After four operations the pupil was clear and the patient could read ordinary print with glasses readily. The operations were never followed by any complications and the result was perfectly satisfactory. In August of the same year the cataract in the left eye was ready for operation and a needling was done. In September a second operation was done, and the patient allowed to go to her home in an adjoining county. This I had not allowed before. She was gone a month and when she returned I found that there had been an iritis following the operation. I had not been notified, nor had the atropin solution which I gave with the first operation been used. There was a complete synechia and occlusion of the pupil. The eye was treated until the inflammatory symptoms had all passed away, and then an effort was made to detach the iris from the capsule of the lens. I thought it was going to be a success, but the pupil would not dilate under mydriatics and the result was negative. When the irritation had subsided I did an iridectomy, hoping to get some relief in this way. The reaction was slight. The eye seemed to be doing well. In February, 1895, I had my right arm broken at the wrist, and allowed my patient to go home again.

She came back in May, after an absence of three months. My coloboma was obliterated, and the pupillary margin drawn up toward the corneal cicatrix. There was considerable ciliary congestion of left, with serous iritis of the right eye. Ophthalmoscopic examination of the right eye was very unsatisfactory on account of the cloudiness of the media. The lower section of the cornea presented a triangular punctate appearance. There was some photophobia and slight sensitiveness to pressure in both eyes. The patient said that both eyes had been very sore, but as sore eyes were prevalent in the neighborhood she had not thought much of it, nor had the family thought it necessary to notify me. The question of enucleation was considered, but as the trouble had already existed in the sympathizing eye about a month, and the condition of both eyes had improved very considerably, it was not thought best to do it. The patient was kept under close observation for five or six weeks. For a while it seemed that the treatment was very beneficial, but the eyes continued to show some ciliary irritation; the punctate appearance of the cornea remained and the lymph deposit in the pupil of the right eye was getting more and more dense all the time. The 15th of June the offending eye became somewhat more congested and irritable, and after a consultation with my friend, Dr. Woodson, an immediate operation was advised. After the removal of the offending eye, the other cleared up very rapidly, and the punctate appearance of the cornea was soon gone, but the lymph deposit remains and the vision is considerably impaired. The patient counts fingers only at a few feet, but sees enough to get about comfortably. I hope to be able to improve the vision by a division of the membrane, when the eye has entirely recovered. This has been to me a very unfortunate case. I have never had just such an experience before. It is the first time I have ever had iritis from a needling, and the only time I ever had sympathetic ophthalmia from an operation of any kind.

This case illustrates the small amount of interest which some patients appear to manifest in their own welfare, and the necessity for the physician's keeping the patient under his immediate observation after any operative procedure.

THE VALUE OF SCOPOLAMIN HYDROCHLORAT IN TESTING REFRACTION.

BY T. E. MURRELL, M. D.,
OF ST. LOUIS, MO.

OPTHALMOLOGISTS have long looked for an ideal cycloplegic for refraction work, that is, an agent that will positively and absolutely suspend accommodation in a short period of time; that will cause no other disturbance of the ocular functions than that especially desired; that will give rise to no toxic symptoms or discomfort on the part of the patient further than the confused vision, and that will be of short duration. Atropin possesses the one element of positiveness of action, if used in sufficient strength and continued long enough, it usually requiring two or three days' repeated instillations of a 1% solution to totally suspend the accommodation. Its long duration, occasional toxic effects, and liability to increase intra-ocular tension in some subjects make it objectionable. Duboisin has been abandoned on account of the great danger of systemic poisoning when used of sufficient strength to fully paralyze the accommodation. In homatropin hydrobromat we have an agent that very nearly approaches the ideal cycloplegic. For a number of years it has been my constant and almost only reliance, an occasional case calling for atropin. I have become convinced, however, after a long and careful study of homatropin in hundreds of cases that it is not absolutely reliable as a paralyzant of the ciliary muscle. In fact, cases have come under my observation where it almost totally failed after repeated instillations. In at least 95% of cases, however, it

answers the purposes for refraction work admirably well. In addition to its somewhat uncertainty in effect it has several detracting qualities. One is, the short intervals and frequency of the instillations required, drawing heavily upon the time and attention of the busy practitioner. Another is, the very short duration of its maximum effect, which is usually reached in seventy-five to ninety minutes from the beginning of the instillations, and begins to decline one or two hours later. When I have been unavoidably delayed an hour or two after the patient should have been ready for the test I have sometimes found a returning accommodation. One of the greatest objections to homatropin is the irritation it produces in the eye. It is claimed that it congests the choroid. At any rate the bulbar conjunctiva is invariably deeply injected by the time the instillations are finished from its local irritating effect, and the patients almost invariably complain of much distress and discomfort in the eyes for the remainder of the day on which used. Some persons have been loud in their complaints to me of the deep aching and discomfort in the eyes after its use. For reasons that are obvious from the foregoing I was ready to welcome a cycloplegic that might prove more satisfactory than any we have hitherto known. Hence it was, after reading Dr. Arthur G. Hobbs' article in *The Refractionist*, and later receiving a reprint from him with additional experiences with *scopolamin hydrobromat* that I determined to make a test of it. Dr. Hobbs points out the very powerful toxic properties of scopolamin when used in too strong solution. To obviate this great disadvantage he endeavored to find the point where its cycloplegic effect would still be maintained and its systemic toxicity lost. He found it quite free from systemic effects when of less than one-fifth of one per cent strength, while its cycloplegic effect was positive as low as one-eightieth of one per cent. To be within safe bounds as to its toxic effects and on the certain side as to its cycloplegic properties, I have used one-tenth of one per cent solution in all my cases tested thus far. It keeps well, my solution, containing 10 grains boric acid to the ounce, is as clear and free of mold as when put up seven weeks ago. To make sure of my tests I have used it only in my office on my private patients, so I could

observe them more closely than dispensary patients. I have now used it fifty-seven times, in both eyes in every instance except one. With a small pointed pipette a drop—about a fourth of a minim—is let fall on the upper margin of the cornea. In fifteen minutes this is repeated. In one hour from the first application the eye is ready for the examination. In ten minutes from the first drop the pupil shows dilatation and almost at the same time near vision shows slight confusion. In five more minutes the pupil is widely dilated and the patient is unable to read small print at 12 inches. Paralysis of the accommodation follows rapidly and I have seen no case in which I had any evidence of want of total suspension of the accommodative function at the end of one hour from the first instillation. While I have not tried it, from the very speedy effects of the first drop I am not so sure but the second drop may be, in most instances, unnecessary. Dr. Hobbs directs that the head be tilted so the drop will not enter the tear duct. This may be necessary with the stronger solutions, but I have paid no attention to this rule with my one-tenth per cent solution, and I have had no systemic poisoning in a single case, unless we except a little boy 4 years of age who resisted putting the drops in his eyes, so I had to hold his head between my knees and in his struggling I flooded his eyes and allowed it to run freely into the tear ducts. In this instance the face became very much flushed, resembling the effects of atropin so often seen in children.

There is no evidence of a particle of local irritation, for the ocular conjunctiva is not injected in the least, but rather, it has occurred to me, it is paler than normal, causing the sclera to appear whiter than before its use. Ocular tension seems to be in no way modified. The patient complains of no discomfort whatever, further than the inability to see well. I have not been able to follow my cases closely to the end, but there is evidence of returning accommodation in twenty-four hours in some cases, and in forty-eight hours in all, and in seventy-two hours reading ability has returned almost invariably. It seems to be very uniform in its action, both as to the inception of paralysis of accommodation and as to its disappearance. Homatropin is not so, it persisting in some persons

four or five days, whereas in others its effects have nearly passed off in twenty-four hours. You can safely tell your patient, after the use of the one-tenth of one per cent solution of scopolamin, that he will be able to read in seventy-two hours. While a powerful and reliable cycloplegic, scopolamin is also a most potent mydriatic, equaling atropin in this respect. In 'only one instance did I try the effect of eserine on the eye just after the full effect of scopolamin had been obtained. A drop or two of a one-fifth of one per cent solution of eserine enabled the patient to read Jaeger 1 at 10 inches in twenty minutes while the pupil was still dilated *ad maximum*. In thirty minutes the pupil was decidedly contracted, but still not to the normal size.

While it lasts a little longer on the average than homatropin I have heard less complaint from the effects of scopolamin from my patients than from any cycloplegic I have ever used. An analysis of my fifty-seven cases brings out the following facts:

Age. The youngest person on whom it was used was 4 years of age, while the oldest was 45. In one person 44 years of age, it brought out a latent hyperopia of 1.25 D. in one eye and .87 5 D. in the other, and greatly modified the correction for a hyperopic astigmatism which I first determined as best I could without it. The ages varied all the way between these extremes. Just here, in parenthesis, I will say: after twenty years' experience my refraction work done under a cycloplegic in persons under 45 years of age is the only work of which I can feel perfectly assured when the patient leaves my office with a prescription for glasses.

Interval between instillation and examination. When convenient, one hour was considered long enough to wait from the time of the first drop, and this was the time at which the testing was begun in the majority of instances, but occasionally other work got in the way and the examination was deferred to one and one-quarter, one and one-half, two, three and more hours up to twenty-three and one-half hours—the longest interval between the instillation and examination in my experience. In this instance the result was satisfactory, though I think it safer to make the test under eighteen

hours. A patient may call in the afternoon and receive the drops and call the following morning for the test, or receive the drops in the forenoon and be examined in the afternoon. There are times when this convenience to both patient and surgeon will be readily appreciated by any ophthalmologist. In two instances I used it where I had formerly determined the refraction with homatropin. It modified the results somewhat, bringing out a 0.50 D. more hyperopia in one instance, the patients getting more comfort from the changed formulæ.

The following case is of interest, both from the stability of the suspended accommodation during the first twenty-four hours and from the rather unusual angle of the axes of the cylinders:

Miss R., 20 years of age, had worn many glasses from specialists and opticians with little satisfaction. V. = $\frac{15}{200}$, either eye. Kerotometer, ophthalmoscope and shadow test showed a high degree of mixed astigmatism. Scopolamin, one-tenth of one per cent. Examination in one hour. Succeeded in approximating correction, but was not satisfied with it. My time was up and I had to stop and ask her to call the next day. Forenoon next day, twenty-one hours later, I renewed the examination. There was not the slightest fluctuation of accommodation. The following formula was soon worked out, which gave her vision $\frac{1}{8}$, either eye: O. D. + 2, C. $105^\circ \circ - 3$, C. 30° ; O. S. + 3, C. $75^\circ \circ - 4$, C. 165° . After the return of accommodation she could read J. 2 readily with these and J. 1 with some effort. She seemed delighted, saying she had never before in her life seen so clearly. No other combination would give half so good vision for right eye as the crossed cylinders with their axis 15° from a right angle.

It is unnecessary to report any further details of the fifty-seven cases thus far tested under scopolamin. They are of the usual type of cases, chiefly of astigmatism, simple, compound and mixed, that are met with in daily practice. So far, not a case has required a second examination, and, as it is my rule to follow my refraction work for some weeks, nothing but entire satisfaction has thus far been heard from any of the fifty-seven persons.

My observation would lead me to believe, therefore, that the one-tenth of one per cent solution of hydrobromat of homatropin is absolutely positive in its control of accommodation, and therefore reliable from one to twelve hours after instillation. It possesses the following advantages over any other cycloplegic with which I am acquainted: In proper strength, it is non-toxic; it is absolute in its control of accommodation; it is the least trouble of any to use, requiring less time and attention of the surgeon, and never requiring to be given out like atropin; it is convenient in that the examination can be made at any time agreeable to surgeon or patient within twelve or more hours; it keeps well and lasts long, one grain being enough to test the refraction of 500 persons. While its duration is some longer than homatropin, it is very little, and is a wonderful shortening of the time compared with atropin. While I still recognize that we have not the *ideal cycloplegic* in scopolamin, I am confident, from my present experience, that it is so far the *best we have*. It may be that the weaker solutions, with which Dr. Hobbs is experimenting, may show further advantages in shortening the duration of paralysis. With the one-tenth of one per cent solution I am exceedingly well pleased, and am daily using it.

THE FORMATION OF THE STUMP AFTER AN ENUCLEATION.

BY GEORGE F. SUKER, M. D.,
OF TOLEDO, OHIO.

THIS may and may not be a new method to obtain a good stump, after an enucleation of the eye, yet, as I have never seen it mentioned in any of the text books, I take the liberty of noting it here.

The *modus operandi* is as follows: Prepare the field of operation as is your custom; divide the conjunctiva as close to the cornea as possible, dissect it as far back as permissable; do the same with the capsule of Tenon. Cut the recti muscles as close to their insertion as possible. Insert into each rectus muscle a black silk suture at the time it is cut. This is to act as a guide. Proceed now as is customary, *i. e.*, severing the nerve and oblique muscles. After removing the eye, take a thoroughly sterilized catgut suture and pass it through the severed end of the rectus externus and internus, which have previously been brought together by the silk suture guides. Now bring the superior and inferior recti down and pass a catgut suture through them. Finally suture the four together and remove the silk guides. Thoroughly irrigate your cavity with sterilized water. At the last bring the conjunctiva from above and below over the muscle stump and suture same with a continuous suture, but be sure you fasten it to the muscle stump. The use of the catgut sutures for the muscles is quite obvious, while you may use silk thread or catgut on the conjunctiva. Leave only a small part unsutured at either canthal end of the conjunctiva as a provisional drainage opening. Again thoroughly irrigate, and

dust ~~the~~ whole with iatrol and bandage in the usual manner. Apply an ~~ice~~ bag immediately after the operation for one or two days to allay, if possible, any local inflammatory reaction which might supervene. Otherwise treat the case as is your custom in such operations. If, perchance, extensive suppuration should occur, remove ~~every~~ suture and treat accordingly. You will, if everything acts properly, have union by first intention, and the result will be an excellent prominent stump upon which an artificial eye will fit exceedingly well. This stump permits of much freer movement of the shell than any other, and then, too, it does away, more or less, with the extreme sunken appearance of the socket after an enucleation. By this method you are apt to preserve a much better caruncle than is obtained by the other operations, thus doing away with the spherical appearance of the shell.

Panas mentions the suturing of the conjunctiva, but not of the muscles.

This method I have employed in three consecutive cases, with very satisfactory results. Whether or not I had exceptionally favorable cases for operation, I do not know, I took them as they came; and whether it is applicable or not in any given case must be left to the discretion of the operator.

PULSATING EXOPHTHALMOS.*

By V. T. CHURCHMAN, B. S., M. D.,
OF CHARLESTON, W. VA.

SECRETARY CHARLESTON MEDICAL AND SURGICAL SOCIETY OF CHARLESTON,
W. VA.; VICE-PRESIDENT WEST VIRGINIA STATE MEDICAL SOCIETY;
VISITING OPHTHALMIC SURGEON TO THE WEST VIRGINIA
SCHOOL FOR THE BLIND, ROMNEY, W. VA.

I HAVE given the above title to my paper because I have, thus far, been unable to make a better diagnosis. Not being able to state positively what I have had, I can only call it by one of the most prominent symptoms. While we may have our beliefs and unbeliefs concerning a pulsating exophthalmos, yet, we have no positive method of determining whether it be due to aneurism of the ophthalmic, of the internal carotid, or an aneurism by anastomosis.

Mrs. W. H. B., 44 years of age, was sent to me by Drs. Parks and Shirkey, of Malden, W. Va., on March 15, 1895, with this history: Five or six weeks ago she had a severe spell of *neuralgia* just back of the left eye, which lasted about two weeks, when this was at last relieved, she found her eye was *swollen* shut and unable to open it; since the neuralgia stopped she has only suffered with pain when she would lie down, and this has been so severe that she has been unable to sleep without large doses of morphin; also complained of very loud noise in her ears, but much worse in the left; it was made worse by lying down; stooping forward increased the protrusion, the fullness of the vessels and the pulsation. She has used *poultices* of all descriptions without any relief, and

*Read before the West Virginia State Medical Society, at its annual meeting, June 27, 1895.

as the *swelling* continued, she consulted the above named physicians, who referred her to me for examination and treatment.

The lids were entirely closed, blood vessels on outer surface very large and tortuous, absolutely no inflammation. There was paralysis of the left levator palpebra, ball pushed forward very much, and a decided pulsation could be felt the moment the eye was touched; medium dilatation of the pupil, which failed to react to light, showing a complete paralysis of accommodation, there was also complete paralysis of oculomotor nerve. Vision in this eye — $\frac{1}{8}$, while that of the right eye was perfect.

There was a false projection of the field of vision to the inner side, as well as exaggerated in the entire field.

Ophthalmoscopic examination revealed only a slight hyperemia of the retina; but veins were enlarged and tortuous.

By use of the stethoscope a bruit could be heard over the entire head, but greatly intensified just over the ball.

The ocular and palpebral conjunctivæ were traversed by large and tortuous veins.

There was also paralysis of the external rectus muscle of the right eye.

All of the subjective symptoms could be modified by pressure upon the left common carotid artery, a procedure which also caused the protruding globe to slightly recede and lessened the strength of the pulsations. Pressure upon the globe would also cause it to recede to a slight extent.

All of the symptoms, whether subjective or objective, were intensified by any mental excitement or physical exertion.

As for treatment, I advised quiet, arterial sedatives and potassium iodid in increasing doses, and to report at the end of ten days.

March 25, 1895. There has been no perceptible influence exerted upon the orbital lesion and I advised the ligation of the left common carotid.

March 26, 1895. I ligated the artery at 3 P. M., assisted by Drs. Schoolfield, Longstreth and Staunton. I tied the artery just above the omo-hyoid muscle without any accident. The common carotid, in this case, was further back than normal,

that is, it was about two-thirds under the sterno-cleido-mastoid instead of being at its edge, at this point. She took ether well; pulse full and strong and no vomiting. The sheath was reached and the ligature needle carrying a double No. 2 catgut passed without difficulty around the artery, tied and cut off short. Having used all antiseptic precautions during the operation, the wound was closed tightly with eight silk sutures, after first bringing the deeper structures together with a small catgut suture. The protruding eye sank very rapidly and was almost normal within six or eight hours.

It may be of interest to know that, just before ligating the artery, I passed the handle of my scalpel under the artery, and, by sufficient pressure, could stop the pulsations in the eye altogether.

At 8 P. M. Pulse, 72; temperature, $96\frac{1}{2}^{\circ}$; was suffering very much, and gave her one-fourth grain of morphin hypodermatically.

At 3 A. M. Morphin was repeated. She suffered intensely with coldness on the left side of her head, for which hot bottles were used.

March 27, 1895, 9 A. M. Pulse, 76; temperature, $98\frac{1}{2}^{\circ}$; no bruit could be heard and no pulsation felt. Still complaining of her head being cold, but she could hear no noises.

There was some amnesic aphasia which, I think, was due to cutting off the blood supply from Brocher's speech center. Ordered liquid diet and whisky every few hours.

March 28. Pulse, 84; temperature, $99\frac{1}{2}^{\circ}$; no pain and feeling good; wanted to sit up. Ordered a light diet.

March 29, 5 P. M. Pulse, 92; temperature, 100° ; was a little restless during the night, and had to give her a dose of sulfonal.

March 30. Pulse, 84; temperature, $99\frac{1}{2}^{\circ}$. She said she heard a faint roar about noon to-day, but that it only lasted about five minutes and then disappeared. No pulsation could be felt, but a faint bruit could be heard just over the ball.

March 31. Pulse, 96; temperature, $99\frac{1}{2}^{\circ}$; condition the same as yesterday. Removed the dressings for the first time and found the wound had healed by first intention. Allowed her to sit up.

April 1. Pulse, 76; temperature, $98\frac{1}{2}^{\circ}$. Neither the pulse nor temperature went above normal after this. Removed sutures on April 2, and on April 6 she left the hospital for her home. Vision is normal with a Sph. + .50 D. lens. A very faint bruit could be heard, but no pulsation felt, nor could she hear any noises. I again ordered increasing doses of the iodid of potassium with bichlorid of mercury and also small does of sulfat strychnin.

April 15. She is taking thirty-five grains of the iodid of potassium three times daily with slight physiological effect. There is slight improvement in the action of the levator palpebræ, superior rectus and internal rectus muscles, as she is able to partially raise the lid, and with much effort rotate the ball inward and upward. I directed her to increase the iodid by one drop of the saturated solution each day and report again in ten days. The bruit is about the same as when here last.

April 26. Condition has greatly improved, as the eye is about two-thirds open and there is more movement in the ball. The physiological effects of the iodid are very pronounced, and stopped it and put her on an emulsion of cod liver oil with the iodids of arsenic, calcium and manganese.

May 28. There has been continued improvement since April 26, she now has perfect motion of the levator palpebra and almost perfect motion of the ball itself. There is still a slight bruit, but not so much as a month ago, and there is still no pulsation. Vision is $\frac{3}{8}$, and made perfect by the addition of a Sph. + .50 D.

I have been unable to find any cause whatever in this case. No history can be obtained of syphilis, rheumatism or injury; has never used alcoholic drinks of any kind.

One peculiar feature of this case is the fact that she has never recovered any use of the external rectus muscle of the right eye.

In conclusion, let me state that in all cases of aneurism of the internal carotid, or of rupture of the internal carotid within the cavernous sinus, that I have been able to find, the ball has been pushed forward, downward and inward, while

in this case the ball was pushed directly forward and could not be rotated either upward, downward, inward or outward, but was as fixed as if it were held in a vise.

As I stated in the beginning, it is impossible to make a diagnosis without a post-mortem, and I am glad to state that I have not had an opportunity for such procedure in this case; yet, I believe I have had a case of aneurism of the ophthalmic artery.

For very exhaustive information on this subject, I would refer to an excellent article by Dr. Robert Sattler, of Cincinnati, Ohio, in the *Medical Record* of June 13 and 20, 1885.

NOTES ON THE RECENT MEETING OF THE GERMAN
OPHTHALMOLOGICAL SOCIETY.

BY CASEY A. WOOD, M. D.

HEIDELBERG, August 7, 1895.

THE twenty-seventh meeting of the *Ophthalmologische Gesellschaft* has just ended after a very successful session. The attendance was quite up to the average, there being over 100 German and French members present, but in point of numbers, England and America were very poorly represented. From the former country, however, came Argyll-Robertson, who acted as chairman of the ordinary meetings during a portion of the time. The name of Dr. Oliver, of Philadelphia, was down for the only English paper on the list, but he was not able to attend, and as far as I know his communication was not presented to the society.

In addition to the usual array of faces, I noticed those of three ladies—Frau Rosa Kirschbaum, of Salzburg, and her two assistants. A reference to the Knapp-Schweigger *Archiv. f. Augenheilkunde* of about three years ago will discover a long and instructive account of several hundred cases of cataract extraction performed by this (in many respects) wonderful woman, which by itself might constitute her right to membership in the society.

There was at least one Japanese member present, who, notwithstanding certain lingual difficulties, presented a paper in German. It was quite noticeable that, as a rule, the Frenchman or Englishman speaking German, or the German essaying French, was much more easily understood than when any of these addressed the meeting in his mother tongue. Defects in delivery were not confined to Germans, but there were some conspicuous and illustrious examples of this nationality who conversed with their "inner consciousness" in tones that could not possibly be distinguished as words more than a couple of meters from the speaker.

Last Monday evening a very jolly and well attended dinner was held at the Schloss Hotel, away up on the mountain side, overlooking the beautiful and picturesque valley of the Neckar below. Tuesday afternoon a number of members visited, by invitation, Prof. Leber's public Augenlinik in the Bergheimer Strasse, and in the evening Professor and Frau Leber gave a dinner and reception in their private house. This was a very enjoyable affair, and served, in part, to celebrate the decoration which the head of the house had recently received.

In addition to the names already mentioned, I noticed among the members the well known faces of Snellen, Wagenmann, Hess, Schirmer, Dor, Kalt, von Hippel, Berlin, Meyer, Oswalt, Schweigger, Uhthoff, Haab, Pagenstecher, Zehender, Michel and Silex.

The sessions begin at 9 o'clock in the morning; there is a recess of two hours at noon, and a second meeting in the afternoon. Most of the papers were illustrated by drawings and microscopical preparations, generally the work of the reader. Surely drawing and water-color painting should be a part of the education of every ophthalmologist. Then by a sort of "*Rückwirkung*," every medical school may come to see its way to requiring some knowledge of these arts as a preliminary to further study.

I was much interested in the discussion of a paper on the operative treatment of certain forms of high-grade myopia—by removal of the lens. The majority were in favor of the operation in those cases where the fundus changes were few and outside the macular region, and where the symptoms were not relieved by glasses or by other treatment. The loss of the power of accommodation and the possibility of retinal detachment (which had occurred in a number of reported instances) were the principal drawbacks set forth by the speakers. It was advised, among other precautions against the latter accident, to proceed very slowly in needling the lens, and if possible to prevent any sudden escape of aqueous. When this does occur, and especially if the rent in the capsule be large, the lenticular mass comes suddenly forward into the anterior chamber and may determine a separation of the over-stretched retina from its underlying bed. One speaker mentioned a case with 5 or 6 diopters of myopia which, after lens removal, was converted into 7 diopters of hyperopia! It

was quite properly objected that the second state of that patient was worse than the first. One speaker offered an explanation of the very different refractive results (which range all the way from 12 D. to 20 D. or even more) following removal of the lens by a difference in the depth of the anterior chamber, *i. e.*, in the distance between the cornea and the anterior capsule in different cases. It was also pointed out that as a result of the constant accommodative efforts, which some myopes make for years at a time, the lens may lose its ordinary bi-concave appearance and take on a more globular shape, and thus to a great degree neutralize the total myopia. After the removal of such a crystalline, the difference between the total ante and post-operative myopia will be greater than in those cases where the lens has not undergone such changes of form.

There is, however, another agent at work in these cases which was not spoken of, and which I offered (when Fukala's first cases were published) as, in part, explanatory of apparent variations in the refractive value of the myopic lens. This refers to a general contraction of all their coats which certain highly myopic eyes undergo after the removal of the crystalline. Such eyeballs are, in consequence of this contraction and *after* the healing of the wounds of operation, smaller eyeballs than they were *before* it. The stretched and stretching ocular coats resume something of their normal condition when the pressure upon them is removed and the eye is brought into a state of rest.

Kalt, who is particularly known for his advocacy of the corneal suture after cataract extraction, read a very enthusiastic paper on the use of the douche as the sole treatment of most forms of acute infective conjunctival and corneal disease, including trachoma. He employs commonly a small glass bulb, shaped like the neck and mouth of a common bottle, to the former of which is attached rubber tubing and a reservoir. The conjunctival sac is, by means of this simple appliance, thoroughly flushed with various mild antiseptic solutions as often as seems necessary. The writer claimed extraordinary results from this treatment, although the essential part of it is not new. It seemed to some of the members that the

manipulation of the lids and eyeball with the glass apparatus is fraught with danger of abrading the corneal epithelium.

The paper of Uhthoff on various forms of keratitis was interesting as showing, in the reported cases, the ravages made by the streptococcus and other microbes upon the anterior parts of the eye. These were illustrated by beautiful drawings of the microscopical preparations.

I hope with the next number of the *ANNALS* to publish abstracts of some other papers that will be of interest.

I made it my special duty at the congress and elsewhere to ask an opinion, of those who had given the method a trial, as to the remedial value of subconjunctival injections of sublimate. On the whole that opinion has proven unfavorable. It was conceded that in some cases of scleritis and episcleritis, whatever their nature, the remedy acted promptly and satisfactorily in cutting short what is so commonly a tedious and vexatious disease. In other cases of the kind it was valueless. I was told of and shown a number of cases of iritis which, proving stubborn under routine treatment, yielded promptly to two or three injections. In the deeper lesions, specific and non-specific, especially in choroidal changes which were at first regarded as particularly amenable to this kind of medication, very few would say that it did any lasting or appreciable good. Moreover to most people the sublimate injections are quite painful and notwithstanding statements to the contrary, I noticed that even public patients in those countries where complaint is rare, did not act as if they were very happy after receiving a dose, and usually said something about it. In fact in the case of these chronic organic vitreous, choroidal, retinal and optic lesions for which patients travel about from klinik to klinik in the hope of relief, this treatment serves very well as an experiment. As a distinguished ophthalmologist replied to my question as to their value in such apparently hopeless cases: "*Il est parfois necessaire de faire quelque chose.*"

I cannot refrain from referring to the recent death of Moos, so long Professor of Otology in Heidelberg University. His contributions to the study of aural diseases, and especially to their pathology, form no small part of the whole record and it will not be easy to fill his place.

CLONIC BLEPHAROSPASM, OF HYSTERICAL
ORIGIN, IN A MALE.BY WENDELL REBER, M. D.,
OF POTTSVILLE, PA.

HYSTERIA in females has been so thoroughly studied, especially by the French, that our knowledge of the subject is relatively complete. Within recent years hysteria in males has been more noticed, and additions of this kind are now being constantly made to the literature of medicine.

Among the multitudinous signs and symptoms of hysteria blepharospasm appears infrequently. In most of the text books, ophthalmic and neurologic, mention is made of its occurrence in females, but the topic is usually dismissed with a few general observations.

The following case history is presented, with the feeling that anything which may facilitate diagnosis in this most perplexing of all functional diseases must be welcome:

March 11, 1895. Henry K., a frail, diffident youth; general condition rather poorly nourished; vegetative functions moderately well performed; family history fair. No neurotic tendencies could be made out. Patient gives a history of ophthalmia neonatorum in infancy, resulting in extensive corneal scars. As he grew up it was found he had sufficient vision to permit reading of large print with difficulty. Two years ago he submitted to upward iridectomy in both eyes, which increased his vision three fold and enabled him to intermittently pursue a little study. The latter he has overdone during the past two months. Seven days before coming under observation, without any precedent pain or inflammation, he lost all power over his orbicularis muscles and his eyes were closed for

several hours. On the second day afterwards they closed again and remained so for four days. On the following day they began to open, and it was at this time I first saw him. Condition at that time: O². There is still present a clonic partial orbicular spasm, rendering the full opening of the eyes difficult on account of the energetic action of the orbicularis. The conjunctivæ are hyperemic, corneæ opaque centrally, but smooth and devoid of irritation. O. S., adherent leucoma. Tension in both eyes doubtfully increased. Vision, O. D. = $\frac{2}{30}$; O. S. = hand movements at 2 feet. Patient was of an impressionable nature, and in the absence of pain or any other sign proportioned to the apparent gravity of the case, I suspected hysteria and ordered a placebo.

March 21, 1895, ten days later. Opens eyelids without any difficulty. Refraction without mydriatic, O. D. + 1.00 D. Sph. \ominus — 3.50 D. cyl. ax. $140^\circ = \frac{5}{30}$; O. S., no glass improves. Correction of O. D. given for constant wear.

Three months later appeared, saying that for four weeks, one or the other eye has been closed once daily for periods averaging from one-half to two hours. The orbicular spasm is to-day in O. S. complete and clonic. The lids can be separated only by the exertion of considerable force with the fingers. Treatment: Constant current for ten minutes over each eye, anode at nape of neck, cathode over eyelids.

Three months later. Has had no recurrence of the orbicular spasm.

The nature of the affection is plain. Such a result from one brief electrization could occur only in hysteria, and as the outgrowth of a profound psychic effect. The case presents two interesting points:

1. The occurrence of clonic hysteric blepharospasm in a male, there being no analagous instance recorded in the literature at my disposal.

2. The occurrence of unilateral blepharospasm. Most authors refer to the phenomenon as a bilateral one. Fuchs, in his vast experience, has seen the unilateral variety but once. He reports the case of a girl who suffered with blepharospasm of this sort, whom he had treated with different remedies in vain. He was finally successful in relieving the blepharospasm by means of a single instillation of cocain, but a few minutes after the girl had opened her eye both legs became paralyzed and remained so for several days.

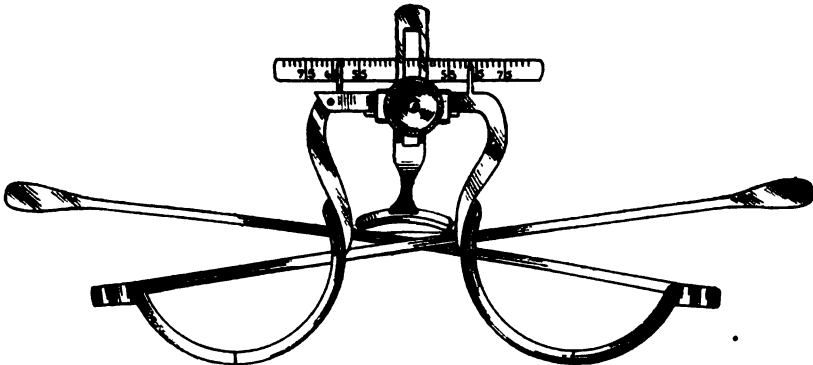
In my own case the blepharospasm, at first bilateral, became distinctly unilateral in the second attack. It is my belief that in this as well as other allied hysteric manifestations in the visual sphere, medicines are to be discarded for galvanism, which, in addition to its psychic effect, affords an efficient method of applying a soothing influence to an overacting muscle. In the event of failure with electricity, I would be tempted to employ therapeutic suggestion as pointed out by Dr. Booth, of New York, to whose article (in the neurologic abstract), in this number of the ANNALS, the reader is referred.

DESCRIPTION OF AN IMPROVED FORM OF TRIAL FRAME.

BY CHARLES A. OLIVER, A. M., M. D.,
OF PHILADELPHIA, PA.

ONE OF THE ATTENDING SURGEONS TO WILLS EYE HOSPITAL; ONE OF THE
OPHTHALMIC SURGEONS TO THE PHILADELPHIA HOSPITAL; CON-
SULTING OPHTHALMIC SURGEON TO ST. AGNES AND
ST. TIMOTHY HOSPITALS, PHILADELPHIA, ETC.

IN November, 1893, the writer had Mr. Wm. S. Yarnall, of
1406 Chestnut street, Philadelphia, make him a model of a
trial frame that could be used by office patients to test muscle
equilibrium and to temporarily try the effect of test lenses in
various combinations before the regular formulæ for spectacles



were ordered. This device, with some additional improvements
by Messrs. Reimold and Meister, of 41 North Thirteenth street, in
this city, constitutes a contrivance that has been almost steadily
and satisfactorily employed in the writer's practice for nearly two
years' time, thus giving the apparatus a sufficient trial to determine
its value and to make its mechanism as complete as possible. As
now constructed, the frame has been made to subserve many more
purposes than were originally intended. As can be understood, by
reference to the accompanying wood cut, the frame consists of a
wedge of brass, to the back part of which is fastened a double
inter-pupillary gauge, thus allowing separate measurements for

both eye pieces. Running through this wedge there are two thin, flattened arms, each connected with its own eye piece. At the end of each arm there is a projecting knob, which prevents the arm from sliding completely out of the wedge. On the arms, at points quite near the beginnings of the related eye pieces, there are two upright indicators which designate the degree and position of lateral separation of the test lenses when held in their proper positions in the frame. Cut into the front face of the wedge, there is a double slot in which a fenestrated upright holding the nose piece can be slid vertically and retained at any desired position by a nut and screwhead. This upright is also gauged, thus giving the degree of vertical variation necessary to be used in each special case.

The rings which hold the test lenses are so grooved that any test lens can be fitted in and revolved by the hand with the greatest facility.

For the simultaneous employment of additional lenses, there is a series of three fine hooks fastened to both the anterior and the posterior faces of the rings.

The temples of the frame have been made straight, broad and long, so as to adapt themselves closely to the temples of the patient. The whole mechanism is so light that it weighs but little more than a half ounce.

The advantages of this test frame over others of its kind may be enumerated as follows:

1. The extreme lightness and durability of the contrivance.
2. The concentration of the working portions in and around the central wedge.
3. The simple mechanism by which an independence of lateral movement in its two sides can be made, thus allowing correct horizontal centering and absolute gauging for each eye.
4. The great lengths and shape of its temples, by which, when properly applied to the head of the patient, the frame is securely, though lightly attached.
5. The simplicity in shape and ready method of working of the nose piece, thus permitting an easy and quick vertical adjustment of the contrivance to be made.
6. The simple, durable device by which spherical and cylindrical form of lenses as well as prisms and other optical contrivances, such as stenopaic slits, tinted glasses, etc., can be employed to their greatest advantage.

Messrs. Reimold and Meister are now prepared to furnish samples of this instrument in its newest and best form.

CLINICAL MEMORANDA.

THREE CASES OF EYE DISEASES OF DENTAL ORIGIN.*

BY A. A. FOUCHER, M. D.,
OF MONTREAL.

Case I. A man, 50 years of age, whose right eye became inflamed after a simple exposure to cold. Upon examination a few days afterwards, a series of small vesicles were to be seen on the upper external margin of the cornea, with both conjunctival and scleral injection.

The tension of the diseased eye was under the normal: the sensibility of the cornea was by no means lessened. Over the orbit, a little above the eyebrow, in the direction of the ascending branches of the frontal nerve, there was a row of small dots, scars and vestiges of opened vesicles. At the same place and a little further, all along the nerve, an exquisite sensibility, exaggerated by the least pressure, was to be noticed.

No cause other than that of entering an ice house and taking cold could be given by the patient to explain his present state. Upon examining the mouth, a large decayed and half-broken molar was spotted as the seat of often repeated aches, specially when in contact of cold water or suckets.

The following treatment was resorted to: Quinin, collyrium of atropin, iodin and morphin to be applied along the frontal nerve and its branches. Eight days under the above treatment still leaves the conjunctiva highly injected with a slight decrease in the inflammation of the cornea. The eye and the orbit are still painful.

* L'Union medicale du Canada, Aout, 1895.

The decayed tooth is extracted. The following day the patient is completely relieved from pain. Four days after, the eye is pronounced cured.

Case II. A woman, 51 years of age, reveals neuritis of the left optic nerve; at a distance of two feet the patient can hardly distinguish her fingers. R. E. V. = $\frac{5}{8}$.

The left orbit is quite tender. Three decayed teeth are to be seen on the left side of the upper jaw, and two on the same side of the lower. There is also osteoperiostitis of the sockets of the teeth with formation of matter. The decayed teeth are extracted, an antiseptic mouth wash is given, peroxid of hydrogen is used to cleanse the gums, oleate of mercury is given in frictions, and iodid of potassium is administered.

After eight days treatment the patient can see $\frac{5}{6}$ with L. E. The same treatment is continued for a few weeks without any further improvement. After six weeks the papilla can be clearly distinguished and presents the appearance of consecutive atrophy.

Case III. The most interesting is that of a girl, 21 years of age, seen December 16, 1893. She had lost the sight of her right eye and suffered great pain in the same. The ophthalmoscope reveals optic neuritis in the right eye. Periostitis was clearly indicated by the pain that was called forth by the least pressure on or around the right orbit. The right eye was completely blind, light itself could not be distinguished. She had just recovered from an attack of typhoid fever. (?) Her courses are frequent and abundant. No trace of any constitutional disorder can be found.

The loss of sight in the right eye coincided with the beginning of pain in the socket.

The teeth being irregular and not in the best state seemed to be the only cause to explain periostitis of the socket of the eye, and the neuritis of the optic nerve and blindness. The patient is directed to a dentist for a thorough examination of the teeth. A wisdom tooth is incriminated and immediately extracted.

The next day a telephone message announces a sudden change, the patient begins to see her fingers and suffers much less. At three feet she can distinguish objects, and all pain has left the orbit except in the lower part of it. Treatment: Mercurial frictions and iodid of potassium internally.

On February 12, V. = $\frac{5}{16}$.

On February 28, V. = $\frac{5}{8}$.

On March 12, V. = $\frac{5}{8}$.

Since then the patient has been seen occasionally and her sight is normal.

This last observation is the most interesting for it clearly and forcibly demonstrates a relation from cause to effect between dental caries and neuritis of the optic nerve. It is also a proof in favor of an immediate intervention, that not only stays the progress of neuritis, but also restores the functions of the optic nerve. The second observation seems to be analogous to the last, in so much as the trouble, though existing for some time before the extraction of the decayed tooth, subsided immediately after intervention leaving a consecutive atrophy due to the too long irritating effect of the tooth on the orbit and the optic nerve, that had underwent too pronounced an alteration in its structure to be restored to health.

The conclusion to be drawn from the above facts, and from several others of much the same kind, is that the teeth must always be closely examined every time that the eye, ear, nose, throat or adjoining sinuses are to be treated. By overlooking such an examination one deprives himself of precise indications to ascend to the cause of the disease and leaves aside a powerful help in the appropriate treatment of such.

ABSTRACTS FROM AMERICAN AND ENGLISH OPHTHALMIC JOURNALS.

By CHARLES H. MAY, M. D.,
OF NEW YORK.

PRELIMINARY REPORT ON SIX HUNDRED AND TWELVE CASES OF CONVERGENT SQUINT WITH SPECIAL REFERENCE TO THE FINAL RESULTS OF OPERATION.

Charles Stedman Bull, M. D., New York (*New York Medical Journal*, August 24, 1895). "Carefully tabulated statistical reports of the results of operations undertaken for the cure or improvement of convergent squint have formed but little part of the ophthalmic literature of the last fifty years; and this fact has produced in the minds of the profession at large, and especially in the minds of some ophthalmologists, the feeling that the operation of tenotomy for the cure of squint is of doubtful value in many cases. The absence of useful, working statistics on this point, has, no doubt, been largely due to the fact that it is extremely difficult to follow out these cases for a sufficiently long time after the operation, because the patients are so easily lost sight of, especially if they be hospital cases, and the first operation has proved only partially successful.

"The feeling that operative procedures for the cure of squint are of doubtful value in many cases arises largely from the discrepancy in our ideas as to what constitutes a 'cure' of convergent squint. If by 'cure' is meant merely the removal of all visible disfigurement, with apparent restoration of parallel axes of the eyes, then the results of operation should be deemed very satisfactory. But if something more is meant, and we understand by the word cure not only the apparent restoration of parallel axes, but the improvement of vision in the squinting eye, the establishment of binocular vision, and the ability of the patient to use the eyes for all purposes except close work, without correcting glasses, then our ideas of the value of tenotomy must be materially modified.

“So wide is the difference of opinion among ophthalmologists as to the existing conditions in squint, the value of operative interference, and the nature of the operation which is to be done, that the writer has long held the view that the whole subject of strabismus is the least understood by modern ophthalmologists in the whole domain of ophthalmic science. We need but glance over our text-books and the contents of our journals to be readily convinced of the truth of this statement. Leaving entirely out of consideration the different views that are held as to the nature and causation of squint, there are many of our colleagues who question the wisdom of operating in early childhood, while others hold that in many instances no operation is necessary.”

Dr. Bull then gives considerable statistical detail which he reviews as follows:

“A cursory review of the final results of the operation on the degree of the squint would lead the surgeon to believe that the greatest effect is to be expected from tenotomy of the internal rectus, and advancement of the external rectus of the squinting eye, and that the method of operation by simultaneous tenotomy of the internal recti of both eyes is the least valuable. A more careful study of each case, however, has led the writer to the formulation of the following conclusions, which may be modified by lapse of time and a larger experience:

“1. If the squint is in one eye, and of the alternating variety, there is usually very little amblyopia in either eye and but little difference in the refractive error of the two eyes. In the majority of these cases free tenotomy of the internal rectus of the eye which usually squints, with immediate full correction of the refractive error, will give as a final result, either apparent parallelism, or such a slight degree of convergence as is not noticeable under the glasses.

“2. If the squint is always in the same eye, there is almost always a decided difference in the refraction of the two eyes, and decided amblyopia in the squinting eye. In these cases, if there is no loss of power in the external rectus, the best results are gained by tenotomy of the internal rectus and advancement of the external rectus of the squinting eye, and subsequent full correction by glasses.

“3. If there is marked amblyopia in the squinting eye and some loss of power in the external rectus of the same eye, the best operation will be found to be tenotomy of the internal rectus and advancement of the external rectus of the squinting eye, and at a

varying period later tenotomy of the internal rectus of the other eye. Simultaneous tenotomy of the internal rectus of both eyes and advancement of the external rectus of the squinting eye is not a desirable operation in these cases, as it too often leads to permanent divergence.

“4. If, however, the squinting eye is markedly amblyopic and the external rectus of this eye is entirely paralyzed, the best results are gained by a simultaneous tenotomy of the internal rectus of both eyes and advancement of the external rectus of the squinting eye.

“5. In the emmetropic cases the best results are gained by tenotomy of the internal rectus of the squinting eye, followed at a varying period by tenotomy of the internal rectus of the other eye; the reason for this is not as yet apparent.

“6. There will always be a number of cases, by no means inconsiderable, in which it will be impossible to decide in advance what method of operating will be likely to give the best results, and in which what we do will be more or less a matter of guess work.

“7. Any complication which interferes with the visual acuity of a squinting eye, such as corneal macula, striæ in the lens, or extensive choroidal atrophy, must be regarded as pointing to the necessity of more extensive operative interference than simple tenotomy, even when no great refractive difference exists between the eyes and where no paresis of the external rectus is present.

“In studying closely these statistics of a considerable number of cases of convergent squint, one of the lessons taught is that though defective vision is probably one of the causes of permanent squint, yet the results of the operation are satisfactory in a very large number of cases. Another fact that becomes evident is that in a by no means inconsiderable number of cases, a tenotomy on the squinting eye is useless and we are forced to do a tenotomy on the other eye. Schweigger seems to be correct in saying that in the majority of cases periodic squint is cured by a simple tenotomy, and that an imperfect result can be supplimented by tenotomy on the other eye.

“The absence of fixation in the squinting eye in some cases of marked amblyopia renders it doubtful whether a satisfactory final result can be gained by any operation. Not a few cases may be found in which only slight improvement was gained even by tenotomy of both internal recti and advancement of the external rectus of the squinting eye.

"It should not be forgotten that a primary good result very often retrogresses, and surgeons do not sufficiently consider that the strength of the antagonistic muscle exerts a powerful influence upon the ultimate result of the operation. Apparent loss of power in the external rectus does not always mean actual loss of power, and Schweigger has some reason for recommending gymnastic exercise of the muscles by alternately turning the eyes to the right and left as a useful preliminary to the operation for squint. It is a mistake to suppose that advancement of a muscle immediately brings about a permanent position of this eye, for, as in simple tenotomy, the immediate result never remains permanent, but usually diminishes somewhat, though it may increase."

TRANSPLANTATION OF A STRIP OF SKIN INTO THE INTER-MARGINAL SPACE OF THE LIDS.

H. Knapp (Report of the meeting of the Ophthalmological Section of the American Medical Association, 1895, *Ophthalmic Record*, July, 1895). In severe cases of entropion and trichiasis, good results can be obtained by an implantation of skin into the intermarginal space of the lid. The steps of the operation are as follows: (1) Ordinary canthoplasty. (2) Incision of the intermarginal space, according to Jaesche-Arlt. (3) Curved incision of the skin, 3 or 4 *mm.* above the ciliary border; removal of a small strip of muscle along this incision. (4) Grooving of the tarsus according to Streatfield. (5) Passing sutures through the lower lip of the wound, the upper edge of the tarsus and the skin of the upper lip. (6) Detaching from the upper lip of the wound, with a straight pair of scissors, a strip of skin 2 *mm.* broad, as long as the incision in the intermarginal space, and implanting it into the gaping and cleansed incision. Sutures may be used, but are not essential. (7) Tying these sutures, four or five in number, the threads may be cut short or stretched and fastened to the skin above the brow by collodion (Panas), or strips of plaster (Born), if the free edge of the lid is not sufficiently everted. (8) Dressing with bichlorid gauze greased with a salve, or leaving the eye uncovered. (9) Cutting the sutures in from three to five days, cleansing the eye every day, gently, so as not to disturb the implanted flap, which in almost every case unites in its whole extent. This plan of operating is to be simplified or modified according to the condition of the case.

CATARACT OPERATIONS BETWEEN THE AGES OF EIGHTY AND NINETY, WITH A TABLE OF CASES.

Hasket Derby, M. D., Boston (*Boston Med. and Surg. Journal*, September 26, 1895). Dr. Derby reports thirty-four cases of which he had records, with the following results:

"Entire success in twenty-nine cases (85%); partial success in two cases (6%); failure in two cases (6%); unrecorded, one case.

"Entire success was estimated at an amount of vision equalling one-tenth and over, the usual standard. The two partial successes had each a certain amount of useful vision. The two failures retained perception of light, but gained nothing by the operation.

"Patients of 80 and upwards form a very inconsiderable proportion of the cases of cataract that come within the experience of the average ophthalmic surgeon here in New England. According to my estimate, they amount to about 6% of the whole number. It would seem that 6% of total failure, large as it would be between the ages of 60 and 65, as contrasted with 85% of success, does not form a valid reason for denying the operation to those advanced in years. The use of cocain renders ether unnecessary, and the senile eye is, moreover, much less sensitive than in youth or even middle age. Under ordinary circumstances the confinement lasts but a fortnight, the patient remaining in bed only the first day. With a prospect of the recovery of sight as good as these figures show, is it right to allow a fellow-being to pass the last years of life in blindness, deterred from the operation by an unreasoning and unreasonable dread of the effect of extreme age on the result?"

THE ASSOCIATION OF CERTAIN FORMS OF MYOPIA WITH DISEASE OF THE NOSE AND PHARYNX.

Dr. Rayner Batten, England. (Report of the meeting of the Ophthalmological Society of the United Kingdom, July 4, 1895, *The Lancet*, July 13, 1895.) After referring to a former paper read before the society in July, 1893, in which he held that certain constitutional diseases produced myopias, distinguishable and differing from each other according to their cause, he proceeded to describe a special form of myopic fundus which he associated with certain diseases of the nose and pharynx. The chief characteristics of this form of myopia were: (1) The existence of localized posterior staphylomata at or in the immediate neighborhood of the optic disc or on the nasal side of the fundus; (2) the tilting of the optic disc in the direction of the staphyloma; and

(3) the edematous condition of the more prominent margin of the optic disc. This edema or "pseudo-neuritis," he considered as secondary to and caused by the tilting of the disc. The conditions of the nose and throat with which he associated this form of the fundus were adenoid vegetations, enlarged tonsils, deviation of the septum, blows on the nose and forehead, ozena, syphilitic disease of the nasal bones and chronic otorrhea. He quoted cases in which myopia had immediately followed the onset of some of these conditions, and in conclusion said that the presence of the edema was generally a sign that the cause was still in active operation; that the visual acuity was seldom good in these cases, even when the degree of myopia was low, and was especially bad when the staphyloma was on the nasal side of the optic disc; that the whole condition was indicative of a progressive myopia, and that the edema and tilting both tended to disappear with the progress of the myopia.

A CLINICAL STUDY OF ONE HUNDRED AND SIXTY-SEVEN CASES OF GLAUCOMA SIMPLEX.

Wm. Zentmayer, M. D., Philadelphia, and Wm. C. Posey, M. D., Philadelphia (*Archiv. of Ophthal.*, July, 1895). The authors have made an exhaustive study of the clinical histories of 167 cases of glaucoma simplex; the following are among the conclusions arrived at as a result of such study: "Simple glaucoma occurs in either sex with about the same degree of frequency, but manifests a preference for the eyes of males. The majority of cases occur at the beginning of the fifth decade. It is quite uncommon, occurring in about .736% of the cases which seek treatment at ophthalmic hospitals. All forms of ametropia are equally liable to the affection. With the exception of articular rheumatism and influenza, which appear to induce changes that favor its development, there are no other particular systemic diseases which predispose to it. It is a binocular affection, although a period of twenty months usually intervenes between the manifestation of the symptoms in the two eyes. The two most prominent subjective symptoms are failing sight and headache, but neither of these possess characteristics which would serve to differentiate them from those occurring in other forms of ocular disease. This form of glaucoma is slowly progressive, two and a half years being the average length of time required to induce

blindness after the appearance of the initial symptoms. Signs of irritation in the anterior segment of the eyeball are usually absent, but 4.52% of the cases exhibit such changes.

“An inflammation of the optic nerve is a constant attendant upon glaucoma, being noted in every eye containing a pathologic excavation. It manifests itself as a low-grade neuritis, affecting the entire structure of the nerve, and seems to render the nervous tissue more liable to the peculiar kind of excavation which is the most constant characteristic of glaucoma. No one of the four findings most commonly observed in glaucoma is essential to the disease, for the disease may occur without an excavation, without the field being contracted, without the diminution of central visual acuity, or without rise of tension. The excavation, however, is the most constant symptom, occurring in 81.43% of all the eyes that were examined. Although the excavation shows a marked predilection to occupy the temporal half of the disc, no part of the nerve escapes. In exceptional cases the excavation appears at the temporal edge of the disc as a continuation of the physiological excavation. From here it gradually spreads over the head of the nerve, encroaching upon its structure until only a narrow rim of nerve fibers remains at the nasal edge. Central visual acuity may remain normal although the field for form and color be encroached upon (in 10.77% of the cases). The tendency of the scleral ring to become visible all around the disc, and its disposition to broaden, especially to the temporal side, are significant of the degree of the intra-ocular tension to which the globe has been subjected, and go hand in hand with the extent and depth of the excavation. As the broadening of the ring, however, usually appears before the excavation, its presence in eyes possessing other symptoms of glaucoma should always excite suspicion of this disease.

“The increase in intra-ocular tension as determined by palpation is not necessarily a constant factor, being detected in 32.63% of cases. Where the tension is increased the field will be distinctly cut or the nerve excavated. Rigidity of the sclera is often the first indication of increased intra-ocular tension. * * * The shallowing of the anterior chamber exists in eyes where there is no excavation, but the converse is not true, for in every eye in which there is an excavation there will be a shallowing of the anterior chamber. * * * Other signs of increased intra-ocular tension, such as the chorioidal halo and the venous and arterial pulses occurring in such a small proportion of cases show that they are not constant factors of the disease, and their absence cannot be regarded as nega-

tive evidence for the existence of a glaucomatous state. Increased tension limits the action of accommodation in only 34.88% of the cases. In the great majority of the cases the limitation of the field consists in a concentric contraction for color and form to an equal extent. The consideration of the relative amount of contraction in the form and color field, often adopted in the distinction between an atrophic and a glaucomatous excavation, is valueless, as the findings show that in quite a large proportion of cases (13.06%) the color field was relatively more affected than the form. Indeed in sixteen of these thirty-two cases (50%) the form field was normal, whilst that for red was contracted twenty degrees or less. Contrary to the findings of other observers, the most frequent type of restriction of the visual field consists in concentric limitation of the entire field and not in the contraction to the nasal side.

“The effect of the administration of eserine and the performance of iridectomy in checking the course of the disease is proportionately the same in the treatment of simple glaucoma. As operative procedures are always to be deprecated when other measures are equally valuable, eserine should be employed in all cases of the disease. If at the end of a month the extent of the fields has diminished, iridectomy should be resorted to, as there will be nothing further to expect from the action of the drug. If at the end of that time, however, an improvement is noted, as evidenced by a study of the field, the drug should be continued, as there is reason to expect that a beneficial action will be exerted for ten months upon the extent of the fields and fifteen months upon the visual acuity. After iridectomy is performed there is ground to believe that the course of the disease will be checked for a period of eighteen months in 50% of the cases. Eserine is powerless in 20%, iridectomy in 10% of the cases. So that 10% of all cases of simple glaucoma will not be benefited despite all therapeutic measures which may be employed.”

SEVERAL CONSIDERATIONS ON THE APPLICATION OF ELECTROLYSIS IN TWELVE CASES OF DETACHMENT OF THE RETINA.

Dr. Terson, Toulouse (*Annales d'Oculistique*, English edition, July, 1895). The writer points out that the treatment of detachment of the retina has remained one of the most obscure points in ocular therapeutics. After calling attention to the objects to be sought in the treatment of this affection and reviewing the different

medical and surgical procedures which have been tried he adds that "none of these operative methods, and none of the medical methods destined to aid surgical action, have enabled one to say that a detachment of the retina, even a recent one, has been cured, or, indeed, effectually arrested in its progress." He recommends electrolysis. "The positive pole should be introduced into the eye as in some cases it is necessary to obtain closure of the puncture wound as rapidly as possible, for fear of causing most dangerous hypotonia. A very small wound should therefore be made and, consequently, very fine needles must be employed." He uses a strong needle made of platiniridium; this is mounted on a small metallic shaft, furnished with a groove to receive a handle of gutta percha, which serves as a handle and as an isolator to concentrate the action of the current in the platinum point. He applies a current of 5 milliampères for exactly one minute; it is important to measure the current with a very sensitive galvanometer. He then gives the histories of twelve cases which had been treated in this manner and sums up the results in these cases as follows:

"Of twelve cases of detachment of the retina operated upon by electrolysis, all very serious, and some truly desperate, I have had one recovery which has lasted for nine months, and can only be attributed to the operation; five improvements which have persisted in an encouraging way after nine, six, three and two months; two negative results, and one aggravation in a case of very old detachment." He draws the following conclusions:

"(1) Positive electrolysis should be applied to recent retinal detachment, and it will have a greater chance of success the sooner it is used after the onset of the accident. (2) This method of intervention interferes in no way with the use of the medical methods recommended for lesions of diathetic origin, the value of which has been shown by long experience, from the palliative standpoint. (3) Clinical observation and experiments on animals prove that the application of a current of 5 milliampères of one minute duration is inoffensive to the eye."

PENETRATING WOUNDS OF THE EYEBALL.

Casey A. Wood, M. D., of Chicago (*Medical News*, Aug. 10, 1895). The writer divides ocular traumatism into three classes: "(1) Those that are serious or not, from the standpoint of sight only, in which we are mostly concerned in asking whether or not

the patient is likely to have useful vision in the injured organ; (2) those that threaten the integrity of the second eye, quite apart from the fate of the injured eye, whose vision may at the time be fairly useful; here the eventual vision of the injured eye must be subordinated to the protection of the fellow-organ; (3) those cases, probably the most numerous, in which sight is destroyed in the injured eye, and anxiety may be felt in respect to the vision of the other eye."

He gives the histories of a number of cases to illustrate these varieties, and says, regarding the treatment of each variety: "The eye is never to be enucleated or eviscerated in injuries of the first class; it is to be closely watched in all examples of the second class, and to be removed unless both eyes become and remain quiet. Lastly, injured eyes of the third class should always be removed."

As an aid to prognosis and treatment he suggests the following rules:

"1. As long as the wound heals without difficulty and no sympathetic irritation exists, I would treat with rest and antiseptics, and would not remove an eye whose injury is confined to the cornea, iris and lens.

"2. I would not enucleate an eye containing a foreign body when the injury was confined to these tissues and the foreign body could be removed.

"3. I would not remove an eye containing a foreign body if there were no injury in the ciliary region, and the missile had passed through the posterior wall of the globe.

"4. I would not immediately excise an eye injured by small shot (which are usually aseptic missiles), even if the wound were in the ciliary region, provided the patient could be occasionally seen by an oculist.

"5. I would always excise an eye that contains a foreign body that could not be removed.

"6. I would excise an eye in which the ciliary body had been injured, even if the sight were not much affected thereby. The only exceptions I would make to this rule are small gun-shot wounds, cases in which the second eye is useless or had been removed, and those instances in which there is no continued uveitis of the injured eye, provided always that the patient could be frequently seen by an oculist. For the average man, however, excision or exenteration would be, by far, the safest procedure in

the last instance. When loss of sight goes along with ciliary involvement there can be no argument in favor of retaining the eye.

"7. When once ophthalmia migratoria has set in, it is wise to retain the injured eye, if there be any sight in it, as eventually it may be the better of the two.

"8. It is safe and proper to remove all continually tender or inflamed eyes of adults whose vision has been lost from a penetrating wound in whatever region of the globe.

"9. It is highly desirable to retain the eyeball in patients under 20 years of age, if it can be done with safety to the better eye, as earlier removal of the globe retards the growth and development of the corresponding orbit, and greatly alters and mars the facial expression."

THE OCULAR SYMPTOMS OF LOCOMOTOR ATAXIA.

William E. Bruner, A. M., M. D., of Cleveland, Ohio (*Medical News*, Aug. 3, 1895). The writer calls attention to the importance of the ocular symptoms as aids to diagnosis, especially in the early stages of locomotor ataxia. These symptoms arrange themselves in three groups: those pertaining to the internal muscles, especially the iris; those concerned with the external eye muscles; and the changes in the optic nerve or optic atrophy.

"The affections of the internal muscles reveal themselves chiefly in pupillary changes, and these are numerous. The most important are: (1) Reflex iridoplegia. (2) Absolute iridoplegia. (3) Myosis. (4) Inequality of the pupils.

"The tabetic affections of the external eye muscles may be divided into two groups: those occurring early in the disease and frequently transient, and those belonging to the later stages of the disease and more often permanent, though either may occur at any stage. In regard to the relative frequency of the muscles or nerves affected, the third nerve is the most often paralyzed, the sixth less frequently, and the fourth only exceptionally; but of individual muscles the external rectus is most frequently affected, while ptosis from paralysis of the levator and paralysis of the internal rectus (causing external squint) are next in frequency.

"The relationship between tabes and optic atrophy is intimate. As regards its frequency authorities differ, ophthalmologists, for example, naturally reporting a higher percentage of cases with atrophy than neurologists. At the very least, 10 per cent of the

patients with locomotor ataxia exhibit more or less optic atrophy.

* * * Optic atrophy is usually an early, sometimes the initial symptom of tabes."

THE PUPIL IN HEALTH AND IN EPILEPSY.

Wendell Reber, M. D., Pottsville, Pa. (*Medical News*, Aug. 24, 1895). The writer mentions that the matter of inequality of the pupils or anisocoria in its relation to epilepsy has been noticed by several observers. His paper directs attention to the percentage of anisocoria—manifest and latent—occurring in persons of average health, and then considers pupillary inequality, as seen among a number of epileptics at the State Hospital for the Insane at Norristown, Pa., during the time he was an interne at that institution.

"From my studies I incline to the belief that the frequency of manifest pupillary inequality in epilepsy is nearer 20 than 15 per cent, and that when investigators have failed to show that amount their work has been lacking in closeness of observation. I further believe that about one epileptic in four will exhibit some latent pupillary inequality. While I realize that my work is open to the criticism of insufficiency of data, I feel justified in drawing the following tentative conclusions: (1) That pupillary inequality, even of considerable degree, is not always pathologic. (2) That in order to demonstrate latent inequalities, the oculomotor influence must be as nearly as possible set aside. (3) That in health latent inequality is more frequent than the manifest form, in the proportion of four to three. (4) That in epilepsy the latent form of the anomaly is more frequent than the manifest in the proportion of two to one. (5) That it is only of relative importance in epilepsy, and can occupy but a minor position in building up the objective picture of that disorder.

AFFECTIONS OF THE EYE IN CONNECTION WITH GOUT.

Jonathan Hutchinson, LL. D., F. R. S., London (*Archiv. of Surg.*, July, 1895). Hutchinson gives the histories of nineteen cases of affections of the eye in connection with gout, with interesting comments. He summarizes our knowledge on this subject in the following propositions:

"1. There is an arthritic form of iritis of common occurrence which has long been recognized by ophthalmic writers. It occurs

in recurrent attacks, often once a year, is very painful, but subsides completely after a time. Its subjects are usually adult men, who, though not liable to podagra, have suffered from sciatica and the like. Aconite, colchicum, opium and alkalies, and liberal counter-irritation are its remedies.

"2. A somewhat peculiar form of destructive iritis, usually symmetrical is occasionally met with in women who inherit gout tendencies, and have arrived at the climacteric period. It is sometimes almost painless.

"3. In men, the subjects of acquired (and inherited) gout, we sometimes see acute and very painful ulceration of the margin of the cornea of a definitely gouty nature, and curable by treatment suited to that diagnosis. It may occur repeatedly to the same patient. Women are not wholly exempt.

"4. Young persons of both sexes of gouty ancestry are liable to insidious attacks of ophthalmitis in which the iris and the vitreous are chiefly involved. Although recurring more or less in repeated attacks, the intervals of immunity are not well marked. It is a very dangerous affection and may greatly damage or even destroy sight.

"5. The affection just described is sometimes associated with a disorganizing arthritis of the terminal joints of the digits.

"6. Young persons of both sexes, but especially young women, are liable to recurring attacks of inflammation of the ciliary region. These attacks continue to recur with prolonged intervals through many years, and although not at first very dangerous to sight, may ultimately disorganize first one eye and then the other. There is usually a history of gout, and almost invariably a marked liability to chilblain. Sometimes there is also a taint of scrofula. The characteristic results of this form of disease are marginal opacities in the cornea and thinning of the ciliary region of the sclerotic.

"7. A very curious condition is sometimes presented by those who inherit gout, which consists in the formation of dusky swellings on the sclerotic at some distance from the cornea. These swellings persist for weeks or months, and when they disappear, leave a sort of subconjunctival scar or pit, where chorioidal pigment shows through. This disease is, I believe, generally recognized under the name of 'episcleritis.'

"8. Under the name of 'scleritis' we recognize certain cases almost always associated with arthritis, and often with gonorrhoeal rheumatism, in which the whole eyeball, as regards its subconjunctival tissue and sclerotic is congested. There is much irrita-

bility and pain. Occasionally the iris is implicated, but the attacks are not, as a rule, attended with danger to the organ.

"9. The term 'hot eye' is applied to certain cases of temporary congestion of the eye often very transitory to which the gouty are liable. They often occur in direct connection with articles of diet.

"10. As might be expected, from the varied character of the possible causes, and their mixed association, there are yet other forms of iritis and scleritis more or less closely associated with gouty tendencies which do not come precisely into any of the above groups."

HOW JAVAL'S KERATOMETER MAY BE EASILY CHANGED INTO A GOOD CHROMATOMETER FOR THE EXAMINATION OF PATIENTS AS TO COLOR-BLINDNESS.

Carl Weiland, M. D., Philadelphia (*Archiv. Ophthalm.*, July, 1895). Admitting that the most convenient and practical tests for color-blindness are those that make use of colored worsteds, the writer points out the disadvantage that worsteds are apt to change in color from handling, light, dust and other circumstances. He then describes a number of instruments in which colors are produced by allowing polarized light to pass through a quartz plate and again through a Nicol's prism. All these instruments are very expensive.

"It occurred to the writer to make use of Javal's keratometer, as this instrument contains already a very fine double refracting prism, and gives a considerable magnification. He got up a little contrivance of his own two years ago, which has worked so well since that he thought himself justified in making it known to the profession, and in thus increasing the usefulness of the Javal instrument. His method differs from that of the authors mentioned though the principle is the same. This color attachment to Javal's keratometer consists of a straight metal tube, about one and one-half inches in diameter, that reaches from the place where the patient's cornea usually is to about the beginning of the barrel of the telescope, and is so fastened to the head-rest that its axis coincides with the axis of the instrument. At the front part of this color tube there is a plane glass plate behind which a Nicol's prism is fastened in a cork. From this prism the polarized light passes by a round diaphragm through a quartz plate cut at right angles to its axis and about 5 mm. thick.

"This is essentially the whole outfit; for in looking with the Javal through this tube one will see two large fine color fields partially overlapping each other. These color fields are of complimentary hues while the place of overlapping shows white, provided, of course, that white light, as reflected from a white surface like a piece of white paper, is employed in this experiment. If now the arc of the Javal be rotated, while the color tube remains in the same positions, the colors will change continually, but always remain complementary, returning, however, to their original hues after the arc has been rotated through ninety degrees.

"I would recommend the instrument to be used in the following way: Place your patient's eye at the ocular of the instrument after you have first looked in yourself and given to the color tube such a position that blue and yellow appear, because thus most color-blind people will recognize two different colors. Now ask your patient whether the two colors are exactly alike or at least shades of the same color. If he answers no, turn the barrel of your Javal slowly through ninety degrees, telling your patient to stop you as soon as the two colors are alike. If he has good color sense he will always see two different colors, but if he is color-blind he will find that in a certain position of the arc the two colors appear alike or at least as much alike as if they were shades of the same color. These colors will usually be green and rose for a green-blind person, while the red-blind person generally selects a more bluish green and a rose with much more red in it.

This suffices to prove that your case is color-blind. But if you want to go further, if you wish that the two colors shall appear exactly alike even in brightness (which can never be attained with the worsteds), then take a second Nicol's prism and fasten it so in front of the eye piece that it can be rotated and is as near as possible to it. If now your color-blind patient looks again, leaving your arc of Javal as before where the colors appeared almost the same, you will, on rotating your new Nicol, easily find a position where the two colors look exactly alike in hue as well as in brightness. Now put down in your case book the position of your color tube, that of the arc of Javal and that of the second Nicol, and you will always be able to reproduce the same color equation, even after years, when the wools would long have faded. The whole procedure for both eyes need not take more than a few minutes and is therefore quite convenient.

"One might argue that this test would not always work well, because it depended altogether upon the faithfulness of the examinee, and a color-blind person might simply refuse an equation between two complimentary colors. This objection has been raised even by Mauthner in the new edition of his *Farberlehre*, 1894, page 127. But it will not be difficult to catch such an individual by putting, without his knowledge, a piece of red glass in front of the color tube so that only red rays will enter the instrument. Under such conditions the two discs must appear alike to him in a certain position of the arc, so that he will be induced more easily to admit the equality of the color fields when the red glass is taken away and replaced by common plain glass. But should he refuse to see two equal colors, even with the red glass, then he would betray his attempt to deceive and be caught by his very denial.

"In the construction of this color tube a quartz plate of 5 mm. thickness was used, but it will be well to arrange the tube so that one or two 5 mm. plates more might be dropped in, because then the colors are much less brilliant and saturated and therefore, on account of their whiteness, better enabled to catch even the slightest cases of color-blindness. But in the writer's own experience, the 5 mm. plate has been always sufficient.

"The advantages of such a method for those who possess a Javal, and therefore have to spend only a few dollars for the color tube, are the following: (1) The colors will never fade or change in any other way as long as white light is used for the test. (2) One need not cover one eye, as only one eye can see at a time. (3) The color fields are large, and it requires no accommodative effort to view them. (4) It is possible to make the two different colors appear exactly alike, while in the worsteds one must be content with an approximation."

ABSTRACTS FROM FOREIGN CURRENT OPHTHALMOLOGICAL LITERATURE.

BY CASEY A. WOOD, M. D.,
OF CHICAGO.

MESSAGE OF THE EYE—PANOPHTHALMITIS PRODUCED BY OLD
LEUCOMATA ADHERENTIA—ANTERIOR SYNECHIAE AND THEIR
TREATMENT BY SYNECHOTOMY—FIBRO-SARCOMA OF THE
ORBIT—THE PNEUMOCOCCUS IN OCULAR PATHOLOGY—WHAT
IS THE BEST TREATMENT OF OLD HERNIAE OF THE IRIS—THE
OCULAR COMPLICATIONS OF DIABETES—OPERATIONS FOR
SECONDARY CATARACT—SOME THEORIES RELATIVE TO THE
CAUSATION OF GLAUCOMA.

The annual session of the Société Française d'Ophtalmologie was held in Paris, May 6th to 9th. I have translated some of the papers¹ presented at that meeting, together with as much of the discussion as was practical and interesting.

MESSAGE OF THE EYE.

The writer² thinks that massage vigorously applied may be a dangerous proceeding when lesions of the globe are present, but in most processes affecting the lids it is extremely valuable. It has the double advantage of being the most effective method of applying to the lids and bulbar coverings medications that can be used in the form of ointment or powders, and of emptying the congested vessels supplied to the ocular tissues. Above all is it indicated in phlyctenular conjunctivitis and keratitis, and in corneal opacities, while gentler applications are of value even in episcleritis, iritis and irido-choroiditis.

Simple massage, *i. e.*, without medication, and by means of the fingers only, or with the aid of some especially constructed instrument, can often be applied with advantage in muscular affections of peripheral origin as well as in vascular irregularities. On the other hand, it is valueless in progressive myopia and in opacities of the crystalline.

Grandclément recommends its employment in cases of interstitial keratitis, and thinks that it decidedly cuts short the course of the disease.

¹ From the June and July numbers of the *Revue générale d'ophtalmologie*.

² *Le massage de l'œil*, M. Parenteau, (of Paris).

PANOPHTHALMITIS PRODUCED BY OLD LEUCOMATA
ADHERENTIA.³

It is well known that a destructive inflammatory process may affect all the tissues of an eye having an adherent leucoma—the result of corneal perforation, operative or other. More than that the panophthalmitis may set in years after the occurrence of the iridic hernia, without warning and without any special evidence of infection.

Terson gives a brief history of four illustrative cases. The first, probably unique, was that of a male patient with trachoma and a double leucoma adherens of several years standing. Inside of a month a most violent and apparently spontaneous phlegmonous inflammation attacked both eyes, necessitating their excision. The three others had a similar experience confined to a single eye; in two of these enucleation was resorted to, while in the other, an exenteration was done.

The pathology of such a condition of things is well-known, its bacteriology having been thoroughly studied. Pyogenic microbes (usually of conjunctival origin) invade the iris by way of the original perforation, infect the ciliary body and corpus vitreum, and bring about a total loss of the eye through suppuration of its contents. There is probably always an early stage of inflammatory infection, or rather of infective inflammation, when treatment may be of avail, and it is effective when the actual cautery is applied to the point of infection and injections of sublimate are given. When, however, the vitreous and ciliary body are plainly involved an enucleation should be practiced. If the cornea has already been perforated we may content ourselves with removing an anterior segment. In neither case is it advisable to put in sutures.

As prophylactic measures synechotomy (combined or not with one or more iridectomies, or even iridodialysis) may be practiced.

ANTERIOR SYNECHIÆ AND THEIR TREATMENT BY
SYNECHOTOMY.

As a sort of complement to the preceding paper the author⁴ advises division of the attachment between iris and cornea where

³ *Panophthalmies consécutives d'anciens leucomes adhérents*, Terson, (Paris), p. 284.

⁴ *Synéchiés antérieures et synéchetomie*, Par. M. Gaupillat, (Troyes).

it is at all practical. When this is deftly done, not only is the eye a safer eye, but for cosmetic reasons it is a much more desirable organ since in the majority of cases (after tatooing) few persons would know that an anterior synechia had existed. It is to be regretted that this very satisfactory operation, which Desmarres practiced and recommended, should have fallen into desuetude. [My readers will find two short but instructive articles on this valuable procedure written by perhaps its best-known advocate in England, Mr. William Lang, in volume XII and volume XIII, pt. 1 of the Ophthalmic Hospital Reports. The twin knives pictured in the first article can be made by any of our instrument makers. Messrs. Weiss & Son, 211 Oxford street, London, W. C., made those used by Mr. Lang. C. A. W.]

FIBRO-SARCOMA OF THE ORBIT.

The writer⁵ has lately had under his care a girl, 16 years of age, who for two years and a half suffered from an orbital tumor that presented several peculiarities of growth. When first seen the disease showed itself on the upper-outer aspect of the bulbar conjunctiva as a yellowish-red patch which extended to the superior fornix. Little by little, this infiltration spread to the orbit, and in two years time it was recognized as a tumor behind the globe, not only adherent to the external orbital wall, but involving the external rectus.

Removal of the orbital contents showed that the external rectus muscles was completely enveloped by an extremely compact covering of fibrous tissue that extended posteriorly to the bony origin of the muscle, and in front to the superior rectus and the lachrymal gland.

Histologically, the body of the mass was formed of round and fusiform cells with vessels and other intercellular tissue, both adult and embryonic. The new growth within the muscles and the lachrymal gland was entirely embryonic.

The results of this inquiry undoubtedly show that the sarcoma originated within the capsule of Ténon. As many sarcomata appear to be due to an infection from without, it is interesting to note that the point of departure in this case was the tissue immediately underlying the conjunctiva which is constantly exposed to various forms of infection.

⁵ *Fibro-sarcome orbitaire*, Kalt, (Paris), p. 273.

THE PNEUMOCOCCUS IN OCULAR PATHOLOGY.⁶

The author adds another to the long list of discussions regarding the pneumococcus and the several often widely differing pathological conditions of the eye with which it is associated. He believes these microbes act as the morbid agent in certain unimportant forms of conjunctivitis, and stand as the principal cause of grave ulcerations of the cornea. Examinations of the discharges in catarrhal dacryocystitis also proved the frequent presence of this bacterium.

One case of panophthalmitis following leucoma adherens, associated with a lachrymal mucocele, presented an abundance of these cocci both in the pus from the eye and in the discharge from the sac. In another case of panophthalmitis which had set up a sympathetic iridocyclitis, the existence of these bacteria was also demonstrated by inoculating a mouse.

The pneumococcus, which is found normally in the upper air passages, produces ocular diseases, not only by infection from without, *i. e.*, by way of the conjunctiva and cornea, but from internal sources—the orbit and the deep structures of the eye itself. The external parts appear to be affected indirectly from the nasal fossæ by the migration of bacteria through the lachrymal passages.

WHAT IS THE BEST TREATMENT OF HERNIA OF THE IRIS?

The author thus concludes his paper:⁷

“Every hernia of the iris left to itself is a constant menace to vision, either from staphyloma or infection.

“The only effective treatment is surgical, because its reduction spontaneously or by the use of eserine or atropia is exceptional and rare.

“The three operative methods most in vogue are: (1) *Excision*, which has its dangers and inconveniences; (2) *cauterization*, which is painful and often unsuccessful, and (3) *incision*, which, when properly carried out, gives results which are both certain and rapid. To gain these the small tumor should be thoroughly divided from side to side—split through in its longest diameter—and allowed to heal under antiseptic precautions.”

⁶ *Du pneumocoque en pathologie oculaire*, par M. Cuenod (Paris), p. 294.

⁷ Sur le meilleur mode de traitement des hernies de l'iris. Grandclément (de Lyon).

THE OCULAR COMPLICATIONS OF DIABETES.

Koenig⁸ thinks these are very numerous, the most frequent being weakness (sometimes amounting to *paresis*) of accommodation and cataract. Of 500 cases examined by him at Vichy, fifty-six, or 11%, had ocular affections, ten of which showed crystalline opacities. There were in addition twenty cases of accommodative weakness, two examples of gangrene of the lids, two of hemorrhagic glaucoma (one followed by death) and two of chronic polio-encephalitis superior, one of which resulted in death after two months. Diabetic cataract, as was long ago pointed out, Koenig describes as being soft in young subjects and hard in old people, and must be dealt with accordingly. Among the post-operative accidents of extraction are edema of the lids and peri-orbital neuralgiæ.

Glycosuric retinitis is characterized by small apoplexies interspersed with whitish exudations. When, however, the latter predominate and when they are grouped about the fovea the presence of albumin in the urine is also to be suspected. The differential diagnosis between these two forms of retinitis from the fundus changes alone is often difficult or impossible. When the optic nerve becomes affected the papillary discoloration that results is that of a simple white atrophy without edema.

Two cases presented some interesting points: the first patient, 54 years of age, had a brother blind from optic atrophy; the urine of the second, 6 years of age, contained 57 grams, 72 ctgr. of sugar per liter.

OPERATIONS FOR SECONDARY CATARACT.

The author⁹ refers to the suspicion with which many operators regard discission or removal of cataractous remains, whether they be thickened capsule, consolidated soft matter, iritic exudations or a combination of two or more of these. Various accidents may follow an ordinary needling, and it matters not if a single needle be used or Bowman's double operation be resorted to. Dragging out the lenticular remains by means of the capsule forceps or hook is still more dangerous, and it has happened to even the most careful surgeon that an eye has gone to destruction from, or has been badly damaged by, an iritis, an irido-cyclitis or an irido-glaucoma, following what is commonly regarded as an innocent

⁸ Koenig. Sur les complications oculaires du diabète.

⁹ Hermann Esberg. Zur Operation des Nachstaars, *Klin. Monatsblaetter für Augenheilkunde*, August, 1895, p. 249.

procedure. Hence Esberg's preference for the capsule scissors, and he has used them for all degrees and kinds of secondary cataract without the slightest untoward result. The opening for the admission of the scissors should be made at the scleral border and must be large enough to admit of free movement of the instrument within the anterior chamber. When the pupil can be sufficiently enlarged the cut is to be confined to the pupillary area, but, if need be, a portion of the sphincter iridis is included between the blades of the scissors. It is rarely necessary, except in old cases where there are broad and parchment-like adhesions between the cataractous debris and the iris, to make a second cut with the scissors at right angles to the first. The writer earnestly recommends this method as safer, more certain and in every respect more satisfactory than any other plan hitherto devised for dealing with such cases.

SOME THEORIES RELATIVE TO THE CAUSATION OF GLAUCOMA.

Koster¹⁰ furnishes us with an interesting report, occupying eighty pages of *Graefe's Archiv.*, of experiments made upon rabbits that adduces some evidence upon the negative side of certain questions regarding the nature of glaucoma. These experiments consisted chiefly in occluding two, three and all of the *venae vorticosæ*. By varying the amount of interference with the venous circulation he was able to determine at one time a temporary and at another period a permanent closure of these vessels, and to study the minute changes that resulted in the retina, ciliary body and other structures of the eye. Although the lesions so produced partly resembled those present in certain forms of glaucoma (as, for instance, the union of the iris periphery to the sclera), the author was unable to find a single instance where the whole picture recalled a typical case of glaucoma as we know it in the human subject. And this was equally true of those animals whose vortex veins had been ligated in pairs or three at a time, or where they had all been occluded. He does not think, therefore, that theories about glaucoma which postulate a congestive stasis in the region of the *venae vorticosæ* as the primary origin of the disease are in any sense tenable. At any rate no such sanction for these or allied hypotheses is to be found in the eyes of the lower animals.

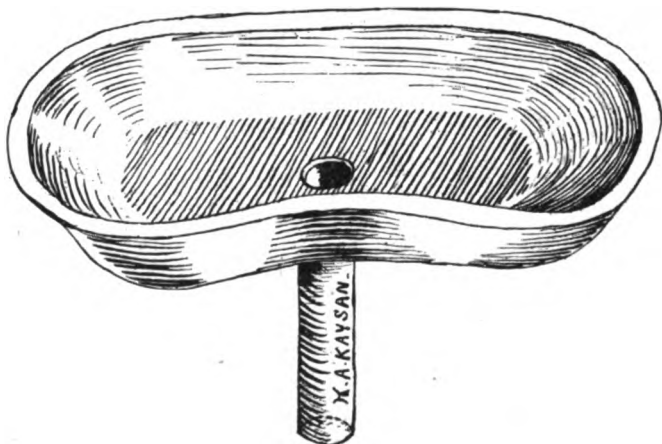
¹⁰ W. Koster. Beiträge zur Lehre von Glaukom. Experimentelle Untersuchung aus dem Laboratorium von Prof. Leber zu Heidelberg. *Graefe's Archiv. für Ophthal.*, Bd. 41, Abth. II.

AN OTOLOGICAL CONVENIENCE.

BY HENRY A. ALDERTON, M. D.,
OF BROOKLYN.

ANY aid to convenience or cleanliness in the treatment of the ear is of more or less importance, therefore no excuse is needed for presenting to otologists the pus basin depicted below.

In syringing the ear or dressing the wound of a mastoid operation the ordinary pus basin has many objections. The patient is obliged to hold it in such a manner that his fingers are more or less soiled by the contents of the basin, and in holding the basin he finds



great difficulty in maintaining its horizontal position; he frequently spills fluids in one or another direction. With the variously devised glasses, as also with the pus basin, frequent removals are necessary in order to empty the vessels when full.

In the following device, consisting of an ordinary hard rubber, papier-maché or metallic pus basin of any of the common shapes, a metallic tube five inches long by one inch in diameter is cemented or riveted perpendicularly to the middle of the bottom of the basin,

after cutting out a button one inch in diameter at the point of application. In use a soft rubber tube one inch in diameter is drawn over the free extremity of the tube in such manner as to form a continuation of it; this rubber tube may pass through a screw-eye let into the edge of the operating table and so down into any large receptacle upon the floor of the office. This screw-eye also serves as a rest to hold the basin when not in use, the metallic tube being drawn through it.

The patient holds the basin by the metallic tube, which makes a convenient handle; the basin is placed in position and all fluids, during syringing or dressing, pass uninterruptedly down the tubes into the receptacle under the operating table, whilst the gauze and other solid dressings remain in the basin and gradually drain, so that they may be removed comparatively dry to another vessel in which they may be taken to be burnt or otherwise disposed of. Also the patient, if susceptible, is not offended by the sight of the offensive discharges and dressings.

The above apparatus is to be had of Mr. H. A. Kaysan, surgical instrument maker, No. 34 Bond street, Brooklyn, N. Y.

138 Clinton street.

A NEW MIDDLE EAR SYRINGE.

By W. H. BATES, M. D.,
OF NEW YORK.

ASSISTANT SURGEON NEW YORK EYE AND EAR INFIRMARY.

THE syringe has been in use for more than two years and is very satisfactory. It is made like an ordinary eye dropper, by heating the glass tube in an alcohol flame and drawing it out into a tube about two inches long and about one-eighth to one-sixteenth of an inch thick. The end of the syringe is drawn out very small, as shown in the accompanying illustration. At the junction of the smaller portion of the tube with the larger it is bent at an angle of about 30° to permit a better view of the drum membrane and tip of the syringe while making an injection.

The syringe is very light and can consequently be easily controlled; the amount of fluid can more easily be regulated, one



avoids pressure against the inner wall of the middle ear, and the syringe causes less traumatism to the ear. The syringe being made of glass enables one to tell when the fluid is passing out of the syringe, an important point, because sometimes the end of the syringe is closed by pressure against some part of the ear and no fluid enters the middle ear. The quantity of fluid injected is also found at once by observing the height of the column of fluid in the tube before an injection and during the progress of an injection. The rubber bulb has advantages over the piston syringe, being simpler it is less apt to get out of order, easier manipulation, requiring but one hand; ability to throw a stream with force; water can be thrown more than ten feet by exerting a quick strong pressure on the rubber bulb, or the fluid can be injected very gradually, drop by drop.

The syringe being simple in its construction and made of glass, it is readily cleaned. The syringe does not break while in use in the middle ear. Finally the syringe commends itself on account of its cheapness as it can be made in a few minutes by any one.

64 East Fifty-Eighth Street.

A NEW MASTOID RETRACTOR.

BY MAX THORNER, A. M., M. D.,
OF CINCINNATI, OHIO.

PROFESSOR OF CLINICAL LARYNGOLOGY AND OTOTOLOGY, CINCINNATI COLLEGE
OF MEDICINE AND SURGERY; LARYNGOLOGIST AND AURIST TO
THE CINCINNATI HOSPITAL, ETC.

SELF-RETAINING retractors to be used in the course of a mastoid operation have been invented by Barth, Zarniko, Allport, Bishop and others. They have the purpose to relieve surgeon and assistants, to a certain extent, during the operation, as it is sometimes extremely tiresome to keep the field of the operation thoroughly clear by having the margins of the wounds well drawn apart. All of these instruments are constructed on the principle of two retracting hooks united at the lower extremities by cross-bars, or by screws by which they are also separated and kept so during



FIG. 1.

the operation. The following simple devise of two separate hooks has been used by me for some time, and has given me great satisfaction.

The instrument consists of a flat S-shaped piece of steel (or German silver) about one and three-fourths inches long and three-fourths of an inch broad (Fig. 1). One of the extremities is shaped into a three or four pronged hook while the other extremity forms a blunt, broad retractor bent in the opposite direction. This instrument is used in the following manner:

When the bone is well denuded and the periosteum pushed aside, the prongs of one retractor are well hooked below the periosteum of the posterior margin of the wound, and the prongs of the

other retractor below the parts of the anterior margin (*i. e.*, the detached auricle). Then a long strip of sterilized gauze about an inch and a half broad, and preferably doubled to render it stronger, is folded in its middle of the blunt end of the anterior hook, drawn across the forehead and around the head of the patient and fastened tightly over the blunt hook of the posterior retractor. (Fig. 2.)

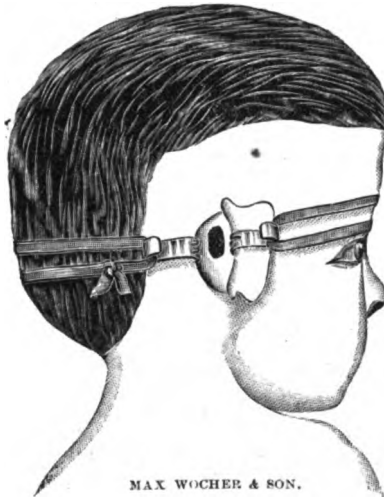


FIG. 2.

In this manner the parts are not only held firmly separated, but the traction exercised upon the hooks by the strip of gauze or a rubber ring (if the surgeon should prefer one) acts to a certain degree in a hemostatic manner. If the relative position of the hooks should require it, the strip of gauze can be drawn anywhere across the face, especially across the upper lip just below the nose. If it should happen that the gauze strip should get loose during



FIG. 3.

the operation it can be readily tightened by being hooked upon one finger of the assistant or by placing anything, for instance a roller bandage between the gauze strip and the forehead.

There are cases, however, in which the amount of tissue which is to be held back by the anterior retractor is so enormous, comprising the auricle, and more or less infiltrated tissues deep down

into the auditory canal, that the usual hook (Fig. 1) cannot sufficiently lift it out of the way. For such cases, and their number is not small, I have had constructed, at the suggestion of Professor S. C. Ayres, a special anterior hook in which the pronged end descends in a longer curve, about three-fourths to one inch from the flat shaft (Fig. 3). With this hook which is somewhat (about one-fourth to three-fourths of an inch) broader, having four instead of three prongs, we can safely hold back the auricle with any amount of tissue.

Little changes in the application of the hooks will, of course, occasionally suggest themselves to the surgeon. The advantages of this method are obvious. The margins of the wound are kept immovably separated. The hooks can be removed and replaced, and their relative position changed in an instant. One, sometimes two hands of an assistant are positively spared, and one may do with one assistant less. Neither the hands of an assistant nor cross-bars of the instruments are in the way of operation. The hooks are readily rendered aseptic, and the gauze is, of course, sterilized before the operation. Those who prefer a blunt retractor to a sharp one may simply reverse the instrument. The slender S-shaped curve renders it easily adapted to the irregular surfaces with which we have to deal. These hooks may and have been used advantageously in general surgical operations upon the head, neck and extremities.

A CICATRIX OF THE MEMBRANA TYMPANI,
VIBRATING SYNCHRONOUSLY WITH THE
RESPIRATION AND THE PULSE.

BY HENRY A. ALDERTON, M. D.,
OF BROOKLYN.

CHAS. DORR, 64 years of age, occupation wheelwright, born in Germany; No. 27,998, Brooklyn Eye and Ear Hospital, came under observation November 18, 1891, suffering from an affliction of the receptive tract. Complained of deafness in both ears for three years, with tinnitus.

The left membrana tympani showed a cicatrix anteriorly and inferiorly, the remainder of the membrane being thickened and retracted. The cicatrix was movable upon swallowing and valsalvation. H. D. watch zero, whisper 3 inches, speech 3 feet, + Rinné, — Schwabach.

The right membrana tympani exhibited a cicatrix anteriorly and inferiorly, otherwise being thickened and retracted. There was no active or passive inflammation of the tympanum and only the ordinary line of injection along the posterior margin of the manubrium. H. D. watch zero, whisper 2 inches, speech 3 feet, + Rinné, — Schwabach.

In the right ear after the act of swallowing the cicatrix vibrated synchronously with the movements of respiration. Shortly the air became exhausted and the membrane rested against the promontory, upon which change in position the cicatrix vibrated synchronously with the pulse. This series of events was repeated so often as the patient swallowed.

The patient continued to exhibit this peculiarity in the right ear while under observation, a period of four months, during which time there were never any inflammatory symptoms in the middle ear.

As the cicatrix was situated so far anteriorly and inferiorly, it was not possible that the pulsation could be communicated through any dehiscence in the bony wall between the bulb of the jugular and the tympanum, and therefore one must conclude that the dehiscence existed anteriorly at that point in the tympanic cavity, where the carotid canal approaches nearest in proximity to it. In other words the bony partition normally existing between the canal for the internal carotid artery and the tympanum was deficient in this case, and so the pulsations of the artery were communicated in certain positions of the cicatrix to it. Hildebrand, Ludewig, Randall and Hartmann have all noted the occurrence of these dehiscences in the tympanic cavity, but so far as the author knows this is the first case in which they have been recognized as communicating motion to a cicatrix perceptible in life.

Under treatment with pilocarpin no improvement occurred, the drug finally disagreeing. After a four months' exhibition of the iodids, whisper heard in A. D. 20 inches and in the A. S. $3\frac{1}{2}$ feet.

138 Clinton street.

DR. PASSOW'S METHOD OF TRANSPLANTATION
FOR THE RADICAL (MASTOID) OPERATION
IN CHRONIC SUPPURATIONS OF
THE MIDDLE EAR.*

BY MAX THORNER, M. D.,
OF CINCINNATI.

A GREAT many otologists, especially in Germany, do not allow the wound behind the ear to close after having made a so-called radical mastoid operation; but try to secure a permanent opening. In order to do this, as well as to bring as much epidermis into the large wound cavity for the purpose of covering as much as possible of the raw bone surface and to thus shorten the time of after-treatment, a number of methods of transplantation have been devised. The last, described in this monograph, differs in several respects from others, and the salient points of it are the following: The incision through the skin lies further back, about 2 *cm.*, from the insertion of the auricle. At the end of the operation the auditory canal is incised at the junction of posterior and lower wall, the incision being parallel to the longitudinal axis of the canal, and being carried up to the cartilage of the auricle, and then upwards at right angles until it reaches the upper wall of the auditory canal. This upper larger flap of the cutaneous portion of the auditory canal is turned upward, and attached to the auricle by a few sutures; it serves thus to cover a portion of the upper part of the wound. The lower remaining portion of the auditory canal is sutured directly to the anterior margin of the primary incision. Then the lower portion of the wound is covered in the following manner: The primary incision through the skin is carried downward and forward at an obtuse angle about one-half inch, and then an incision is added, which is parallel to the auricle. This flap is turned upward and sewed into the wound, covering very well the lower portion of the wound. This operation has been carried out successfully at Prof. Trautmann's clinic by Dr. Passow, and is not only feasible, but will give excellent results as a goodly number of cases, seen by the writer, have clearly

* *Berlin, Hirschwald, 1895.*

demonstrated. The details of such an operation, of course, cannot be explained in a review, but require a thorough study of the original, where they are well elucidated by a number of excellent engravings.

THE IMPORTANCE OF CORYZA IN CHILDREN.

Dr. E. Fink (*Halle a. S. Karl Marhold*, 1895). This monograph of thirty-six pages is the second of a series of essays on diseases of the nose, ear and throat, edited by that indefatigable worker, Maximilian Bresgen. Twelve monographs will make one volume, and the prospectus promises to furnish a goodly number of papers by well-known laryngologists and otologists. The essay under consideration is one of unusual interest. The learned author has collected the whole literature referring to acute and chronic coryza in children, and has no difficulty to convince the reader of the importance of this generally neglected part of pathology. Without going to extremes, he distinctly points out the consideration the acute and chronic forms of rhinitis deserve in children on account of the many consequences which neglected cases entail for the patient. From this standpoint this essay should interest not only the specialist but even more so the general physician and the pediatrician. After having given a clear account of the immediate and remote effects of impeded nasal respiration, upon the shape of the hard palate, the upper jaw, the thorax, etc., the connection with adenoid vegetations, with laryngitis, bronchitis, etc., he goes into detail to show how the different organs, and how the whole body is more or less exposed to dangers which were almost unknown fifteen years ago. These points are, of course, well enough known, yet the author understands to speak very convincingly and interestingly about them. However, there is a point, which is rather novel and interesting, *i. e.*, his view regarding the connection of so-called scrofulosis and chronic rhinitis in children. Generally it is assumed that the chronic rhinitis, the broad, swollen nose, the eczema of the vestibule of the nose, etc., are some of the complications of what we are wont to term scrofulosis. The author takes the stand that a chronic rhinitis in childhood is the cause of many affections in neighboring organs, in lymphatic glands and mucous membranes, which go far to constitute the complex of symptoms, generally known as scrofulous, or even tuberculous. There are a great many other views, which will render the reading of this little pamphlet of more than passing interest.

M. T.

ECZEMA OF THE EARS.*

BY J. ABBOTT CANTRELL, M. D.,

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DISPENSARY, PHILADELPHIA.

GENTLEMEN—In following me this morning I wish to impress upon your minds, and especially upon your healthy ears, the utter despair into which one may be thrown by having these organs affected by any disease which is at all likely to cause deafness, either as a temporary condition or as a permanent loss of hearing. The first question for us will be the study of the varieties of eczema, which we may at any time encounter upon the ears or affecting its contiguous parts, especially where it joins the head, either at its superior, inferior or posterior borders.

The varieties with which we may be confronted are either the erythematous, vesicular, or pustular, and whether it is one or the other it is alike, very distressing to the one afflicted. Upon the external ear proper, the lesions usually met with are the vesicular or pustular, and in both conditions the lesions are very often found to be almost innumerable. Upon the affection attacking both the ear and contiguous parts, it is more likely to be the erythematous variety in these situations. Above and around the ear there is likely to be much inflammation, and possibly slight infiltration at the beginning of the condition, but after it is allowed to progress for some time, this is usually found to have increased almost to alarming proportions—so much so that the ear or ears are seen to be swollen to enormous extent, and to stand out from the head as if to get away from the diseased area. The disease attacking this portion of the ear is not always followed by the disease extending to the inner portions as the meatus, but this does occasionally occur. This disease attacking the external ear may often be

*A clinical lecture at the Philadelphia Polyclinic Hospital.

influenced by certain conditions, such as a person wearing spectacles, and the auricular limb of the frame cutting the parts and keeping up a condition which has already begun, or possibly assisting somewhat in the production of the disease in those who are predisposed to it through family influence, or through some inherent tendency of the individual affected. In those who are not particularly cleanly in their habits, or in those who may irritate the parts by too frequent ablutions. Certain affections which are the result of the high winds of winter, that is, whatever may assist in the production of frost-bite; certain diseases of the scalp which may be caused possibly by uncleanness, or by contact with some one who is themselves of a dirty habit; I refer to one of the animal parasites, the pediculus, this little animal traversing through the hair, causing an intense desire on the part of the afflicted to get relief by means of their finger nails, and thus possibly causing the extension of disease to the ears themselves. Unkempt hair is likely also to produce this condition, especially when it is allowed to collect in folds around the ears and thus irritate it by their coarseness, and the carrying of disordered secretions from the sebaceous glands. When this disease attacks the auditory canal it is usually secondary to that affecting the external pinnae, or it may be produced as the primary affection on account of persons having the bad habit of continually picking at their ears, either with the point of the finger nail, which is often allowed to grow to enormous lengths for this purpose, or some pointed instrument as the end of a lead pencil or a quill which has been sharpened to a point. Being produced in whatever manner it may, the disease is a very annoying one to those who may be unfortunate to be the afflicted. In this region the accumulation of cerum, mixed with the inflammatory products such as the fine, branny flakes in one instance, or the larger scale in the other with the consequent infiltration, there is likely to be some deafness which, although only temporary as a rule, may become more serious if the disease is allowed to go unattended. If these abnormal collections are not removed at a very early date they are likely to assist in the production of small abscesses which themselves, after once being formed, may keep on forming for some time. Thus it will be seen what this condition may result in if the proper attention is not applied as early as it is possible for one to do such. It is always well to remember and give your friends and patients this advice, that whatever affects the ear or ears should be given immediate attention, because as I have shown you, it is so likely to result disastrously.

In making our diagnosis we are to remember that other diseases are also likely to resemble, to some extent at least, the condition under consideration, and as one of these, erysipelas, is often a grave affection we must keep our wits about us, but when we remember that this is a systemic condition in which we have heightened temperature, decided malaise, utter despair of the patient with the hardened feel of the part and its heightened color, warm feeling of the part, and its well-marked and distinct border giving us plainly the extent of the disease, while in connection with this we have an area which is at all times dry. While in eczema we have a portion which is usually moist, with decided itching, some thickening and infiltration, an ill-defined border, that is, one which fades into the surrounding healthy skin. We likewise have to differentiate this condition from dermatitis caloricæ which also often resembles eczema, but in this latter affection we meet with it only in summer season, or if met at any other time the condition differs because the lesions are likely to be almost furuncular and discharging enormous quantities of pus; it is usually raised in the manner of a cone with edges of heightened color and tipped with a slight crust at all times, while in eczema we are more likely to find a diffuse eruption which is moist, crusted and occasioning decided itching and other annoying and disagreeable feelings.

The first case that I bring before you occurs in a child, 6 years of age. The lesions occupy the lower portion of the lobe of the ear. They are distinctly vesicular, and they number from ten to thirty, but as the general rule is with lesions of this character witnessed in this disease they have run together, and the crust which has formed is found to cover a number of lesions and differ in this respect from those of a pustular character in that the latter lesion has a crust which covers each lesion, and does run together with others in their close proximity. You also notice that the inflammation is of a very high degree, and that the parts around are swollen to almost double the natural size. The child complains of great distress in that of itching and pain occasioned from the unnatural size of the organ which, as you can plainly see, stands out some distance from its normal position. The condition has not extended from the primary seat of the affection because it has been of only a few days' duration, and has not had time to become very extensive as the child has been brought early for treatment. The first thing to do in the case before us is to remove, if possible, at an early date, the inflammation by a starch poultice

or dressings of boric acid in saturated solution with water, or if preferable, we may employ the solution of chlorinated soda of the pharmacopea. After we have, to some extent, relieved this swelling we can then advise some remedy that we expect will procure a cure, as for instance, calomel in ointment form in the proportion of from 10 to 30 grains to the half ounce of the official ointment of rose water; if this should, at any time, seem to have no effect, resorcin may be prescribed in the strength of 15 to 20 grains to the same amount of ointment base, or an application of from 5 to 10 grains of salicylic acid or salol to the same quantity may be given. This child will return in two or three days and the effect of treatment by calomel will be noticed, and if the result is as good as we wish we will continue it. We will also give a laxative in this case and have the intestines evacuated freely every day, and at the same time, the food of the child shall be selected from those which are more bland.

This lady comes with an eruption upon the ears also. She has now been a sufferer with it for about three months, and as the condition would be better one day and then bad the next, she thought possibly that it might run its course and in that manner cure itself; but as it has not taken this turn, but has been more troublesome within the last three weeks she comes for relief. Upon examining the ear you may notice that the eruption covers its entire extent and spreads somewhat upon the parts which are in close proximity. The eruption is of an erythematous character, and is, as a rule, moist, but at times it becomes very dry at which time it is usually covered with a crust. You can see that the ear has swollen to an enormous extent, and from this the woman receives a great amount of pain and itching. The disease also is found affecting the meatus, and as the moisture from the eruption is extensive, and from the inflammatory character of the condition we have an enlarged increase in the amount of cerum formed, and this, with the former discharge, dries and forms into crusts and blocks the passage, and for days at a time she is unable to hear with this ear. Naturally the first remedy must be directed against the high character of the inflammation, and after this has been relieved we may use more curative measures. We are to clean away the collections in the meatus by either a wash of boric acid or the solution of the chlorinated soda applied freely and often. After which we may advise one of the following in ointment form: Salicylic acid (5 to 10 grains to the ounce); calomel (10 to 40 grains to the ounce); salol (10 to 30 to the same quantity); resorcin (about 15

grains) or possibly the ear will demand more astringent remedies, and if so, we may give sublimed sulphur (1 dram to the ounce). calamin in minute quantity, an emulsion of ordinary starch, or a drying powder such as Fuller's earth. This woman will also receive directions as to the manner of eating and keeping her general health in proper order.

In some of these cases it may be advisable to make use of cod-liver oil, or it may be more preferable to give the syrup of the iodid of iron, in others it may be necessary to otherwise treat existing symptoms. It must always be remembered that there are complications arising in all cases, and these must receive proper attention. Always see that patients are placed under the best hygienic influences, both in and out of the house.

TINNITUS AURIUM AND SOME RESULTS OBTAINED
BY ITS TREATMENT WITH CONIIN
HYDROBROMATE.

BY VINCENT GOMEZ, M. D.,
OF BROOKLYN, N. Y.

ONE of the most troublesome conditions the aurist is called upon to treat, and for which a great many remedies have been proposed, is tinnitus aurium.

Tinnitus is a frequent symptom in many diseases of the external, middle and internal ear. It is usually present in all those conditions where there is undue pressure on the tympanic membrane from cerumen, imperfect entrance of air into the tympanic cavity, due to obstruction of the Eustachian tube or effusion within the tympanum.

It accompanies most inflammatory diseases of the external or middle ear, follows injuries to the tympanic membrane and blows upon the head or ear, and is a prominent symptom in nearly all nervous affections of the auditory apparatus.

So infinite are the degrees and variations of this symptom that there is probably no known sound to which it has not been compared by patients.

The descriptions which patients give of the noises depend to a certain degree upon their fancy, their graphic power of explanation, and not infrequently upon their rank of life and the sounds with which they are most familiar.

Tinnitus aurium is usually, although not always, a subjectively disagreeable symptom.

It may be assumed that the normal ear is filled with continuous sound. The blood flowing through the large arteries and veins in close proximity to it (such as the carotid artery and jugular vein), as well as the blood flowing through the vessels of the internal

ear, would give rise to sound by throwing into vibrations the tissues surrounding them, including also the walls of the vessels themselves. This motion is sufficient to excite the auditory elements by causing vibrations of the intra-labyrinthine fluids, and so produce sound, which, being a normal condition and one to which the ear is accustomed, will remain unnoticed. The arterial system of the body throws the neighboring tissue into vibrations, but this is not recognized unless attention is particularly directed to it, or, in other words, the entire body is filled with movements as a normal condition, and this, therefore attracts no attention. But let this movement be increased—for instance, by violent muscular exertion, increasing the arterial action, or lessening it, as in syncope—and at once the abnormal condition draws our attention to it.

In the same way the ear is filled with continuous sound as a normal condition, and therefore it is not perceived, these sound vibrations escaping out through the middle ear and external canal. This can be readily proved. Let the external auditory canal be obstructed artificially either by the finger or by a cork. At once a tidal tinnitus, so called, is produced; this being caused by the normal sound vibrations being impeded in their outward passage and being thrown back again to impress the nerve elements for a second time. This, being an abnormal condition, is at once recognized.

Tinnitus caused by obstruction of the normal sound vibrations in their outward passage through the middle ear and external canal; tidal tinnitus, so called, from a resemblance to the noise of the ocean. Such obstruction may exist in the middle ear cavity, as thickening of the soft tissues of the middle ear, exudations and adhesions, as found in chronic catarrh, or in the external canal, as impacted cerumen, or a swollen canal, etc.

The effect of such obstruction would be to interrupt the normal sound vibrations and cause them to reverberate and impress for a second time the auditory nerve elements, causing an abnormal and therefore recognized condition. This is the most frequent variety of tinnitus, and for the reason that it is produced by the more ordinary ear diseases.

Tinnitus caused by abnormal sound vibrations produced either by increase or by decrease of intra-labyrinthine pressure. In a normal condition the auditory nerve elements are subjected to a given intra-labyrinthine pressure, now, if this pressure be altered (either by being increased or diminished), an abnormal condition ensues, and is noted as such.

Tinnitus produced by increased intra-labyrinthine pressure may be caused by increase of the intra-labyrinthine fluids (by effusions, hemorrhages, etc., as in so-called Menière's disease), or can be caused by increase in the amount of blood flowing through the arteries and veins of the internal ear. In either case there will result an increase of pressure that is exerted on the auditory nerve elements. Also, another result of such increase of pressure on the arteries of the labyrinth would be to throw them into more active pulsation, and so cause greater movements of the intra-labyrinthine fluids. These abnormal vibrations impinging on the auditory nerve endings would be noticed as such, and give rise to tinnitus of a pulsating character corresponding to the movements of the pulsating vessels. Such a condition is frequently observed in an eyeball afflicted by glaucoma, or can be produced in a normal eye by exerting pressure on the globe. The veins of the retina will be first thrown into movements, and as the pressure increases the arteries will show marked pulsation. Why should not a similar set of conditions in the internal ear give rise to the same results?

Tinnitus produced by a lessened intra-labyrinthine pressure may be caused by loss of intra-labyrinthine fluids or by a lessened blood supply to the internal ear. The latter cause being the most frequent, a familiar example of this would be the tinnitus experienced by a fainting person, a common sensation being a swimming head accompanied with strange whizzing noises in the ear. The tinnitus of anemia is of this class, and frequently of the pulsating variety. In this variety of tinnitus it is supposed that the sound conducting apparatus of the middle and external ear is normal, if any obstruction exists, it would naturally increase the amount of tinnitus.

Tinnitus may be caused by a diseased condition of the auditory nerve, either in the part lying between the internal ear and brain or in the brain center itself, pure subjective tinnitus.

Here we enter upon an obscure field from the fact that so little pathological research has been made in this direction; but, reasoning by analogy, why cannot the auditory nerve be subject to as many diseased conditions as the optic nerve, where the ophthalmoscope has clearly shown the existence of neuritis, atrophy, and many other pathological changes caused, it may be by disease of the retina, or it may exist as an inflammation of the nerve itself exterior of the eyeball, or it may be due to a brain tumor pressing on the optic nerve or optic tracts, gummata, osseous growths, etc.,

have in turn caused optic neuritis; lesions at the optic nerve endings in the brain itself have given rise to well-defined pathological changes in the optic nerve which, by means of the ophthalmoscope, can be demonstrated and recognized. Now, if these changes exist in the optic nerve, why may not the same condition be present in connection with the auditory nerve, although from its anatomical location, they are not capable of demonstration as in the case of the optic nerve?

And, as in the latter, phosphene symptoms are common, due to nerve irritation, so in an irritation of the auditory nerve tinnitus would be developed, but of a subjective character.

Tinnitus may be noticed in cases of inflammation of the middle ear where fluid has collected, and is caused by the bursting of air-bubbles in their passage through this fluid, the air gaining access to the tympanic cavity by way of the Eustachian tube. Tinnitus so produced resembles a bubbling or crackling sound. In some cases where the membrana tympani has lost its elasticity it gives rise to a crackling sound due to the membrane becoming stiff and dry; also there are cases of tinnitus produced by foreign bodies being deposited on the drum membrane such as cerumen, pieces of hair, etc., giving rise to a rustling or rasping noise.

In myringitis subjective noises are seldom absent, varying in accordance with the intensity of the morbid process going on in the tympanic membrane. The stimulation of the auditory nerve, to which they are due, is brought about chiefly in consequence of the great hyperemia of the deeper structures which is associated with inflammation of the membrane. It is in part caused also by the pressure exercised by the inflammatory products upon the membrane, and hence transmitted through the chain of the auditory ossicles. Spasmodic contractions again of the tensor tympani muscle may set up a special tinnitus in acute myringitis, to which Lincke drew attention as being described by patients as resembling the fluttering of butterflies.

In nearly all acute middle ear suppurations we find tinnitus to be quite a prominent symptom; sometimes it takes on a pulsating character, at others a low pitched sound gives rise to much discomfort. In these cases where the tinnitus assumes a low pitched character it is apt to be more constant.

In mastoiditis I have observed a form of tinnitus which was present in 95 per cent of the cases seen in the clinics at the Brooklyn Eye and Ear Hospital. The character of this form of tinnitus resembles the blowing of a bellows, being of low pitch, constant

(?) and blowing. It is the tinnitus that usually accompanies all acute middle ear suppurations intensified by the increased blood pressure and the somewhat long-continued dilatation of the blood vessels.

Subjective auditory sensations in middle ear catarrh are caused by the same morbid changes as bring about the impairment of hearing. It is, therefore, easy to understand how much they may vary during the course of the same affection.

Their rare occurrence in the case of children is very notable. Even with severe exudative inflammations of the middle ear noises in the ear are almost invariably absent with them from the first to last. This may be due to the greater resisting power in children of the structure closing the fenestra ovalis whereby the base of the stapes is not pushed so far inwards, and the intra-labyrinthine pressure consequently less easily increased.

Just as in some cases the hearing becomes better in the midst of a noise, so also there are instances of tinnitus which, usually constant and distressing, are rendered much less marked or even disappears altogether when the patient is surrounded by noises or is subjected to repeated concussions.

Usually in these cases the improvement in the subjective sounds is associated with an improvement of the hearing under the same conditions, (*paracusis Willisii*) and it is not unlikely that the two conditions have a similar origin and significance.

Patients frequently complain that the tinnitus is more annoying at night, this being due either to the fact that their attention is more readily called to it then when everything is quiet and there is nothing to distract their mind, or being due to the increased congestion of the head caused by the recumbent posture.

Tinnitus, like deafness, is especially marked in advanced life when the natural senile changes occurring in the middle ear interfere with sound conduction and aggravate any catarrhal state that may be present. In women it is apt to become particularly prominent about the time of the menopause.

Auditory hallucinations such as occur now and then in aural catarrh may, in most cases, be regarded as a sort of tinnitus modified for the patient's mind by the peculiar interpretation which his psychical state leads him to give to them. That is, they probably take their origin in most, if not in all cases, from actual sounds generated in or about the ear, sounds which, unimportant in themselves, are altered by the patient's imagination and magnified into matters of great significance. Thus, the noise of the blood pulsat-

ing in the vessels or the crackling of a dry and atrophic drum membrane may, to an imaginative and nervous person, be transmuted into the voices of dead friends or some other supernatural sounds. And as the imagination is apt to be most powerfully impressed at night, when also the tinnitus is usually most pronounced, the supposed voices and other hallucinations are generally heard at this time, while during the day, the patient may not be troubled by them.

After a chronic catarrhal process has existed for a long time in the middle ear, the tinnitus which was at first distressing may become less marked or may disappear completely. When both ears are involved the tinnitus is often more severe upon the side last affected. This is undoubtedly due to the fact that labyrinthine changes upon the side primarily affected have gone on to such a degree that the portion of the labyrinth, which normally responds to sounds similar in character to the tinnitus, from which they formerly suffered, has been completely exhausted, and no longer reacts to stimulation due to increased pressure.

Involvement of the labyrinth, as secondary to chronic catarrh of the middle ear which causes great and often sudden increase in the deafness may produce either increase or decrease in the tinnitus, according as the auditory nerve fibers are simply irritated or are rendered functionally incompetent. Accordingly, the permanent abolition of tinnitus in advanced cases of aural catarrh points strongly to grave involvement of the internal ear.

When these noises are intermittent, and due chiefly to congestion, they are frequently synchronous with cardiac pulsations, but as the disease advances, this pulsating tinnitus diminishes and is replaced by a constant high-pitched musical sound as the lower portion of the receptive tract becomes involved.

In those cases where the tympanic process is confined chiefly to the region of the oval or round windows, the interference with transmission may be so slight as to occasion very little impairment in the hearing, and the subjective noises may constitute the sole symptom.

The writer wishes to call attention to the results obtained in the medicinal treatment of tinnitus in twenty cases.

The medicinal agent being "Coniin Hydrobromate."

Before entering upon the report of these cases it is well to give a brief résumé of the physiological action of this drug.

The full-grown fruit of *conium maculatum*, Linné (*Nat. Ord. Umbelliferae*) gathered while green. The plant varies in narcotic

power according to the weather and climate, being most active in hot and dry seasons and in warm countries. The conium of Greece, Italy and Spain is said to be much more energetic than that of the north of Europe. The leaves and fruit are official. The extract of the seeds is about ten times stronger than that of the leaves. All the preparations of conium are very uncertain in strength. But the best preparations are the fluid extract and the alkaloid.

The alkaloid is coniin and to it hemlock owes its action.

It is an oily, limpid liquid having a strong alkaline reaction and a peculiar odor. It may be given in doses of gr. $\frac{1}{80}$ to gr. $\frac{1}{30}$ or in minim doses from m. $\frac{1}{10}$ to m. ii. The chlorhydrat, and especially bromhydrate of coniin, are greatly to be preferred to any of the other (?) preparations of conium. The bromhydrate is freely soluble in water and also in alcohol, having but little taste and but very slight odor, and is not actively toxic.

The preparations of conium possess a considerable degree of acidity, and are, therefore, apt to produce gastric irritation. The active principles readily diffuse into the blood. What changes they induce in the blood are as yet unknown. When taken internally in sufficient doses they produce very profound weakness, associated, it may be with vertigo and disordered vision. The muscular prostration is extreme, the eyelids droop from weakness, the voice is suppressed, the pupils dilated; consciousness is usually preserved to the last, and life finally is extinguished without struggle.

The chief action seems to be upon the motor nerves which it paralyzes; the efferent nerves are also affected, but to a much less extent.

Conium properly exerts no direct influence upon the cerebral centers, but it is a spinal depressant.

No constant and characteristic post-mortem appearances seem to be produced by coniin.

[To be Continued.]

THE EVILS OF WILDE'S INCISION.—A. CHIPAULT
AND A. DEMOULIN.*

TRANSLATED BY VINCENT GOMEZ, M. D.
OF BROOKLYN, N. Y.

PROF. DUPLAY, in his recent treatise on surgery, says, in 1862 Wilde proposed that in cases of suppuration within the mastoid cells, to make a deep and long incision down to the periosteum, and that if the symptoms persisted after twenty-four or forty-eight hours, to trephine the mastoid process.

This practice was adopted by the majority of aurists, but we think that it has not any advantages and makes us lose valuable time. If there is really pus within the mastoid cells the external incision does but little good.

In our estimation it only does good in cases of simple periostitis without involvement of the mastoid cells.

Hence Wilde's incision is rarely indicated. In the majority of cases its employment is not reasonable because it does not attack the seat of the trouble, but merely relieves a symptom—"pain."

Unfortunately it is as yet practiced in a great many cases where it should not be employed, because it is not difficult to perform and does not seem dangerous.

The history of the cases in which Wilde's incision was practiced, and which we have examined at Prof. Duplay's clinic, are sufficient proof.

In fact, from a total of seventeen cases we have only noted four times where the incision was cicatrized and visible, in the other thirteen the incision was infected.

Five times the infection was due to sub-periosteal collection and the incision had a tendency to pout, the incision was made nine

* *Annales des Maladies de L'Oreille, du larynx du nez du pharynx.*

times, going through non-infected tissues; the infection was undoubtedly due to septic fluids coming through the external canal and gaining entrance to the wound. Seven out of nine of these secondary suppurations were fulminant; one gave rise to an inflammatory edema of considerable extent over the lateral portion of the neck, an edema which yielded to vigorous antiseptic precautions; one a facial paralysis due to the formation of a purulent focus at the level of the stylo-mastoid foramen; another gave rise to a necrosis of the transverse process of the atlas, accidents necessarily of great importance necessitating prompt action and giving rise to aggravation of the primary otitic affection.

We deem it advisable to note these two observations.

CASE I. *Otitis media grippale, Wilde's incision; consecutive purulent discharge with compression of the facial nerve.*

X., 38 years of age, January, 1895, had an otitis media grippale on the right side, which was treated by boric acid syringing through the external canal, in a few hours a tympanic perforation which gave issue to an abundant discharge until the end of January. At this time the discharge diminished abruptly and accompanied with great pain in the mastoid region. An application of a fly-blister was made, followed by a Wilde's incision, which was followed solely by a little bleeding and cicatrized in a short time. The relief from suffering was short, the pain returning.

Antipyrin and sulfanal were employed without success, and a slight elevation of temperature was noted; another incision was necessary, and, like the first, only gave issue to blood and no pus; the mastoid and surrounding parts only presented a slight amount of inflammation. Nevertheless the incision became infected and a purulent focus made its appearance, which extended along the sterno-mastoid. The slightest movement of the neck gave rise to much suffering, a facial paralysis now rapidly came on, with deviation of the mouth, and flatness of the nasal alæ. A paralysis of all the branches that arise and come through the stylo-mastoid. The branches that arise at the petrous portion were not affected; there was no difficulty with deglutation, no deviation of the velum palatii, nor hyperacousis.

After a long incision anterior to the Wilde's, down to the inferior portion of the cervical swelling, the sterno-mastoid muscle was detached, it could be seen that the focus extended to the anterior portion of the process and over the fibrous envelope of the parotid, and went up as high as the level of the stylo-mastoid foramen, where the nerve was bathed with pus. Its cavity was thoroughly

opened and drained with iodoform gauze, and fifteen hours after our interference the facial paralysis was notably diminished. Jointly with this treatment the middle ear, which again suppurates some, is carefully disinfected.

CASE II. *Left otitis media. Wilde's incision. Purulent discharge. Necrosis of the transverse process of the atlas. Resection of this process.*

A. B., a vigorous individual, 40 years of age, commenced to suffer in September, 1894, with the left ear fifteen days after the onset of the trouble, and abundant discharge made its appearance. At the same time he commenced to experience very acute mastoid pain for the relief of which a fly-blister was applied followed by a Wilde's incision.

This incision was rapidly followed by extensive swelling of the mastoid wound which necessitated a second incision which proved insufficient to arrest the progress of the disease. At the time the patient entered the hospital in December, all the supero-lateral portion of the left side of the neck was tender, indurated and inflamed, three fistulous openings were present, one antero-superior, another above the denuded mastoid, another postero-superior and sub-occipital which arises in the median line, and is directed towards the vertebral foramen in a downward direction to the transverse process of the atlas which can be made out under the skin with the finger right under the mastoid apex. These three fistulæ which discharge a considerable amount of pus communicate with each other by large fistulous tracts. The walls of the tympanic cavity have not been denuded at any point. During the month of February a long incision was made which permitted the union of the fistulæ, opening the purulent tracts and prove that the occipent, and the mastoid presented lesions of a very superficial nature, only finding a slight roughness of the bony parts, but the transverse process of the atlas was the seat of a diffuse ostitis which necessitated its resection.

After having curetted the surrounding soft parts the bone forceps were needed to accomplish the necessary resection, and special care was taken not to wound the vertebral peduncles and arches; it is probably unnecessary to say that during these proceedings the greatest care was observed not to wound the vertebral artery. We had the good fortune to complete the operation without any accident, and obtained a satisfactory result.

The result has been so favorable that the discharge at present has nearly ceased, and the fistulæ have entirely healed. The

diverse movements of the neck can at present take place with great ease, and the patient has only a slight impediment of the neck, and has left the hospital.

These two cases where Wilde's incision was performed has served for a point of entrance of infection, and the complications have been very serious.

Facial neuritis in one case, ostitis of the atlas in the other. Our patients, thanks to the timely interferences, have made a good recovery. These facts, like those of less severity reported by us, we deem are sufficient to condemn the superficial mastoid incision; there is no exact point where a local suppuration should be incised, and when such a focus exists it is not the place to make Wilde's incision, but a long incision should be made that opens up the various diverticula of the collection; it is an incision that is made to open any abscess, and not an incision in a precise location that is meritorious of a place in the domain of operative surgery under a particular name.

TRANSLATIONS FROM CURRENT FOREIGN OTOLOGICAL LITERATURE. (ABRIDGED).

BY H. A. ALDERTON, M. D.,
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TREATMENT OF CEREBRAL ABSCESS. SEQUEL TO OTITIS MEDIA.

L. Picqué (Soc. de chirurgie, séance du 29 dec., 1894). An interesting discussion has taken place in the Soc. de chirurgie, following the report of Picqué. This classes in two categories cerebral symptoms of otitic origin—in the one, the very distinct functional symptoms easily give the diagnosis of cerebral abscess; in the other, the abscess not occupying the motor zone, the symptoms are vague and the differential diagnosis between cerebral abscess, meningo-encephalitis or phlebitis of the lateral sinus, is more delicate. However, a persistent cephalalgia localized at the same point, with coma and slowing of the pulse, certainly indicates cerebral suppuration. Moreover, cerebral abscesses are oftenest accompanied by a diffuse purulent collection which forms a sort of line of communication between the mastoid suppuration and the cerebral suppuration. The course to be followed by the surgeon differs as he finds himself confronted by the one or the other class of symptoms. If there are troubles indicating a lesion of the motor zone, it is necessary to at first trephine the cranium at the level of the suspected convolution, then afterwards to open also the mastoid process. If there are, on the contrary, vague cerebral symptoms, one must be content at first to open the mastoid; and if in about forty-eight hours, the symptoms do not amend, to go resolutely to searching the intra-cranial space, utilizing the passage already opened.

Berger adopts absolutely this method. If by the opening in the cranium a traumatic encephalocele is produced, he applies no particular treatment to it; generally, in a few weeks, the encephalocele is reduced of itself and cicatrizes with the soft parts.

In a general way, the surgeons who took part in the discussion, Routier, Schwartz, Lucas Championnière, are of the opinion that in the presence of cerebral symptoms, supervening in the course of an otorrhea, it is necessary at first to trephine the mastoid process and to wait before pushing the interference further.

ECZEMA OF THE EXTERNAL AUDITORY CANAL.

Hermet (*Jour. de med. de Paris*, No. 4, 1895) considers nitrate of silver as the best agent to employ, as well in eczema as in furunculosis of the auditory canal.

He applied it in the following manner: After having thoroughly cleansed the canal by means of washings with boiled water, he introduced a tampon of cotton soaked in silver nitrate $\frac{1}{10}$, and left it twenty-four hours in place. The next day the canal was uniformly black, but the atresia had disappeared, the cauterized epidermis had become detached in shreds in about two or three days. The patient was cured for the time being.

For furunculosis the technique is identical, with this difference, that the cauterization should be renewed two days in succession. If the furuncle is recent, resolution occurs; if it is on the point of opening, the nitrate corroding the skin, works like the stroke of a bistoury, the furuncle empties itself, and there is no other subsequent inoculation.

FOREIGN BODY IN THE EXTERNAL AUDITORY CANAL.

D'Aguzzo (*Gaz. degli ospit.*, 2 fev., 1895) shows that the swelling of the auditory canal, in consequence of the irritation produced by the foreign body, and the attempts at extraction, is in general the principal obstacle to the extraction. Several maneuvers—introduction of the little finger into the canal to dilate it, tractions drawing the auricle forward, and especially movements of the inferior maxilla—often facilitate very much extraction. The movements of opening and closing the mouth impart very distinct movements to the antero-inferior part of the canal and suffice sometimes to urge toward the outside a foreign body deeply involved.

COLLECTION OF ASCARIDES DEVELOPED IN THE INTERIOR OF THE MASTOID PROCESS, AND SPONTANEOUSLY DISCHARGED EXTERNALLY.

L. Vidal (*Jour. de Clin. et de Ther. Infantiles*, No. 48). A child, 22 months of age, who, at the time of the first examination,

had presented for a month a painless tumor back of the right ear. This tumor increased little by little in volume without giving trouble, then opened spontaneously, allowing passage to a clear and not very abundant liquid. A physician called in found a fistula situated parallel to and 1 *cm.* in front of the line of insertion of the auricle—"from the exterior auditory canal came a discharge clear and incessant; the walls of the tumor appeared externally very hard and gave, on percussion, the sensation of an osseous shell." Injections through the fistulous passage of a weak solution of sulphate of copper. After the first injection four small reddish-white worms were evacuated, which the author recognized as *ascarides lumbricoides*. The following day another evacuation of three worms of the same species. The child was then lost to view.

What passage had the *ascarides* followed to achieve their migration? The parasite must have mounted by the stomach, the esophagus to involve itself in the Eustachian tube and gain the middle ear, but how explain the passage into the interior of the mastoid? The mastoid cells do not exist in the infant; they are represented by an osseous block of dense tissue, and it is not until later that they communicate with the middle ear. Could there have been in this little patient an exceptionally precocious evolution of the cells and of the petro-mastoid canal?

THE INFLUENCE OF FATIGUE UPON THE AUDITIVE FUNCTION.

Poli (*Arch. ital. di Otol., etc.*, 1894, *fasc.* 4). It is known that the effects produced by excessive muscular labor do not consist solely in the fatigue of the muscles which have been exercised, but make themselves felt through all the rest of the organism; particularly upon the nervous system, and that perhaps through a true auto-infection resulting from the passage into the blood of the excrementitious materials produced by the over-worked organs. *A priori*, these effects should be especially manifested upon the special senses whose delicacy is well-known. Poli tried to find out if there existed in man, after great physical exercise, a modification of hearing. To that purpose he examined the twenty-four first arrivals in a bicycle race of fifty kilometers immediately upon their dismounting from the wheel, then again after a period of rest of from two to seven hours. Only two of the contestants acknowledged subjective noises which were, moreover, diminished by repose. But with nearly all there existed a diminution more or

less marked of the aerial perception for the watch; in some cases the Rinné was negative without the condition of the conducting apparatus giving a plausible explanation of this fact. In the rare cases where he could make an examination with a series of forks, Poli noted a certain diminution in the perception of the high tones. The objective examination showed for all lesions a hyperæmia of the membrane localized at the periphery and along the manubrium. After a repose of some hours the aerial perception increased with sixteen from several centimeters to 1 meter fifty; the increase was especially marked with those who were the least in training, and, therefore the most fatigued; with these, the Rinné which had been negative at the first examination, became positive. With two, the aerial perception was less good; in six, finally who were among the best trained, there was no change. One may conclude from these examinations that fatigue produces in man a diminution of hearing but that that diminution is transitory.

A CASE OF MYXO-SARCOMA OF THE TYMPANUM.

A. Kuhn (*Deutsch. Med. Wochens.*, 1894, No. 27). A child, 1 year old, suffering from an abundant and fetid otorrhea of the right ear. For several weeks the canal has been obstructed by a reddish-gray mass which fills the auditory meatus completely. Also there exists a fistula on a level with mastoid apex through which the probe penetrates deeply above and forward in the direction of the canal. After removal of the tumor with the snare and enlargement of the fistula, one came upon a tumor inserted deeply in the internal wall of the tympanum which, extending, divided externally into two portions, of which one is developed in the external auditory canal, the other perforating the osseous wall of the canal, penetrated into the mastoid to the level of the insertion of the sterno-cleido-mastoid.

Some weeks after the extirpation the cure seemed assured; there existed only upon the labyrinthian wall a tissue thick and bleeding easily, but not covering any denuded bony surface.

Relapse occurred three months later. Death by cachexia supervened soon afterward.

Microscopically the tumor was a myxo-sarcoma originating in the submucous cellular tissue of the internal tympanic wall where one meets at birth with a gelatiniform embryonic cellular tissue.

ABSCCESS OF THE MAXILLO-PHARYNGEAL SPACE; ULCERATION OF THE INTERNAL CAROTID; OPENING OF THE PURULENT POCKET INTO THE PHARYNX AND INTO THE EXTERNAL AUDITORY CANAL WITHOUT LESION OF THE TYMPANUM.

Meslay (*Bull. de la Société Anatomique*, Dec., 1894, p. 948). This interesting case of acute lateral retro-pharyngeal abscess with ulceration of the internal carotid artery at its superior part was observed in a child five years. The interest of this observation, independently of that of ulceration of the carotid, very rarely observed, lies also in the exit of pus by the external auditory canal without invasion of the tympanum, a thing which would happen in course of time from the proximity of the pus with a region not defended by bone.

In this connection, Broca, who was concerned in the surgical treatment of the child, spoke of having observed another case in which the apex of the petrous bone was soaking in a cavity of pus, and that condition had given rise to an acute otitis media. With this patient there was also ulceration of the internal carotid.

INTRA-TYMPANIC INJECTIONS IN THE TREATMENT OF DRY CATARRH OF THE MIDDLE EAR.

Adolphe Bronner (*Brit. Med. Jour.*, 1894, p. 805). The writer believes that the abandonment of intra-tympanic injections is unjustifiable. He frequently uses this treatment with good results; the deafness progresses less rapidly; after each injection the hearing is ameliorated for a time varying from several days to some months which determines the frequency of the injections. After having tried all the substances recommended, the author uses a 3 per cent solution of bicarb. of soda in a mixture of water and glycerin, equal parts; occasionally he uses parolein, pure or in connection with bicarb. of soda or iodoform. The instruments and liquid are carefully sterilized.

STACKE'S OPERATION IN SUB-DURAL ABSCESES.

Ferreri (*Arch. ital. di otol.*, fasc. 4, 1894). Stacke's operation, which gives excellent results in the treatment of O. M. P. C. with lesions of the ossicles and of the antrum, is applicable as well in the cases where the lesions affect specially the tegmen tympani, there exists in this latter a meningeal irritation, habitually latent

and circumscribed, but which menaces at every instant to propagate itself to a distance and to degenerate into a veritable meningitis. This operation offers, indeed, the best method to reach the purulent collections developed between the dura mater and the internal vitreous lamina of the temporal. The diagnosis of these abscesses is oftenest made only in the course of the operation; a fistulous orifice, from which oozes a drop of pus and into which one may introduce the probe in the direction of the cranial cavity, betrays its existence. The enlargement of this orifice and the exposure of the dura mater are the necessary complements to the operation of Stacke; this intervention alone permits the curing of the patient.

Ferreri has just made an experiment upon a young girl, 20 years of age, with an O. M. P. C. since infancy, and which had been operated upon for the second time for right mastoiditis April 20, 1894; after the operation the retro-auricular wound cicatrized rapidly enough, but discharge persisted by the canal; three months later, pain having supervened in the temporal region at the same time that the right eyelid became edematous. Ferreri practiced Stacke's operation and was constrained in the course of it to lay bare the dura mater to give issue to a purulent collection. In about forty days the patient was completely cured of her discharge and only retained, as a trace of the operation, an infundibuliform cicatrix of the mastoid region.

AUSTRIAN OTOLOGICAL SOCIETY.

Session of May 28, 1895. President, Prof. Gruber; Secretary, Dr. Pollak. Urbantschitsch presented four patients:

Case I illustrates the particularly favorable influence exerted on several occasions by the extraction of the malleus upon the auditory function of the other ear which was secondarily affected. The patient, 34 years of age, had suffered since her 14th year from a left otorrhea, which, after ten years, gave rise to a deafness of the right side. The treatments employed continued to be without effect, and finally the patient could perceive the whispered voice in the right ear at no more than two or three paces.

On February 15, 1891, to cure the suppuration of the attic of the left side, the malleus was removed and found healthy; following this extraction the suppuration diminished sensibly, and at present it is altogether inconsiderable. After the operation, the left ear remained as inert as before from the functional point of view, while, from the day of the operation, the right ear improved

notably as to hearing (whisper heard at four paces) which increased on the following days to ten or twelve paces for the sharp whisper, and which maintained this improvement at the end of four years.

Case II is also one of the extraction of the malleus, which did not improve the hearing for the better ear but which resulted in the cessation of the violent vertigo and prevented the progressively constant diminution of the hearing. After healing a callous cicatrix formed upon the membrane at the place where the manubrium formerly existed, and which gives absolutely the impression of a malleus handle.

Case III presents a tumor of the right auditory canal, osseous and nodular, filling the lumen entirely, that one could get around with the sound from above, in front and below, and which is attached to the auditory canal and the mastoid. This exostosis has the consistency of ivory, even as can be seen in trying to remove it peacemeal from the auditory canal. The tumor will be operated upon soon and the results communicated.

Case IV relates to a benign neoplasm of the left auricle, whose seat is the border of the helix where it passes into the lobule; which diminishes under pressure, is circumscribed, is displaced toward the base of the cartilage and has a more compact consistency in its narrow part. The use of alcoholics, the action of cold, causes the tumor to reach the size of a walnut, which had before only been the size of a hazelnut. At the next meeting Urbantschitsch will define the nature of the tumor, which he intends operating upon.

Discussion: Case I. Politzer asked Urbantschitsch in what manner he explains the amelioration of the hearing in the ear not operated upon. According to Politzer there exists nothing which provokes this phenomenon.

Urbantschitsch believes that one must attribute the synergic action to the two tensors of the tympanum, which has been demonstrated by the experiments upon animals of Pollak and the researches of Gellé.

Politzer said that these explanations were not satisfactory. The synergic action of the tensors in man has not been proven, moreover the unilateral affection of the middle ear of the other side should be much more pronounced, which is not the case here.

Urbantschitsch relies upon the cases which he had presented at the last meeting of the Naturalists, and in which, by means of the rarefaction of the air of one side, it might influence the power of hearing of the opposite side.

Case II. Gomperz had observed a similar post-operative cicatrix simulating the manubrium.

Urbantschitsch asked Gomperz if this condition might not be attributed to a periosteal excitation of the internal tympanic wall. In his experience there existed no adhesions.

Gomperz responded that, in his case, the cicatrix had united with the internal tympanic wall.

Gruber considered the formation as springing from the superior canal wall.

Urbantschitsch asked if callous cicatrices of the *Mt.* had been seen before?

Gruber had never met with one, and he had never seen more than one membrane develop following the extraction of the malleus.

Case III. Politzer considers the tumor an osteoma springing from the mastoid apophysis and appearing in the external auditory canal. This kind of osteoma is rare. Politzer has not described it in his treatise.

Gruber has seen such cases in his clinic and has operated upon them, but they resembled chondroma.

Pollak, in relation to the genesis of these tumors, reports that he had one case, an osteoma, completely filling the external auditory canal which, a year after extraction, was replaced by a fibrous polyp. Unhappily the patient was lost to view.

A. Politzer. Rare form of exostosis of the external auditory canal with presentation of the method of their removal. The author said that in spite of the large number of observations of exostosis of the external auditory canal there were only a few methods for their removal.

Politzer showed a specimen from a scientist of sixty-nine years which he has frequently had occasion to observe for thirty years. Upon the first examination the author found the right external auditory orifice obstructed by an exostosis of a yellow color arising from the posterior-superior border whose free antero-inferior straight border touched the opposite wall of the auditory canal. The patient could furnish no information of the genesis of this exostosis, and could not affirm having suffered previously from otorrhea. The principal symptom was a deafness produced in part by the exostosis, and partly by the accumulation of cerumen and epidermic masses behind the exostosis.

After the removal of these masses, by the means of fine sounds introduced into the auditory canal, an operation which was repeated at intervals of four or five years, the hearing improved,

and an important subjective diminution was obtained. The patient would not consent to ablation of the exostosis. "Several years ago he was sent to me by Dr. Teleki who told me that for several days the patient suffered from violent pain, and that there was a fetid discharge. Again by the introduction of a canula of very small caliber between the exostosis and the wall of the external auditory canal, I destroyed the yellowish-brown putrid epidermic masses and checked the painful symptoms."

The patient succumbed to consumption two years ago, and according to his last wish, Politzer removed his auditory organ for scientific purposes. The specimen presented the following appearance: From the posterior-superior edge of the orifice to the osseous auditory canal starts an exostosis, slightly nodular, of $1\frac{1}{2}$ cm. in length and 1 cm. broad. It seems limited by ridges slightly raised from the side of the squama of the temporal and the surface of the mastoid. After the removal of the soft parts and of the antero-inferior wall of the auditory canal, the lumen of the canal was found obstructed by a brownish-yellow epidermic calculus mass which penetrated even into the tympanum by a small perforation of the membrana tympani of the dimension of a lentil. After the ablation of these masses the auditory canal appeared much enlarged, the tympanic margin above the membrana Schrapnelli, about the size of a lentil, and the orifice was filled by a fine cicatrix which touched the malleus and the incus. The superior wall of the auditory canal, up to the small bony edge which limits the superior orifice, was destroyed by pressure, and passes into a cavity of the wall a little larger than a cherry which partly occupies the mastoid region. The base of the exostosis extends to one side in the blunt edge which separates the wall of the auditory canal from the large cavities situated above, on another side it penetrates directly into the cavity. The mastoid apophysis had become entirely like ivory. The superior tympanic cavity and a part of the antrum was filled with newly-formed connective tissue, the middle and inferior tympanic cavities were free; the labyrinth and acoustic canals had experienced no change.

In conclusion Politzer remarked that the exostosis was probably imputable to a previous otorrhea, and that the osseous anomalies of the auditory canal, and in part of the mastoid apophysis, were due to the retention of the epidermic masses. The perforation of the tympanic membrane, as well as the perforation of the osseous cavity directed towards the antrum, have been favorable to the migration of the epidermic masses from the middle ear into the

external auditory canal. It is more than probable that an early destruction would have prevented the formation of the osseous anomalies of the temporal.

A. Politzer. *Presentation of a patient upon whom the radical operation of emptying the cavities of the middle ear was practiced, followed by transplantations of Thiersch.* Woman, 46 years of age, very healthy until now. The origin and first appearance of the aural affection are unknown. One year ago there existed for a short time a slight inodorous discharge from the right ear. Four weeks before her entrance into the hospital she experienced sharp pains in and behind the left ear; since fourteen days the apex of the mastoid has been visibly tumefied.

At the first examination the auditory canal was narrowed, filled with pus, the middle ear filled with soft granulations, the soft parts of the mastoid process normal superiorly and at the middle; at the apex was found an abscess as large as a walnut which appeared spontaneously from a sinus of the size of a head of a pin.

April 18th, last, the radical operation was performed with plastic transplantation of the wall of the auditory canal; in the tympanic cavity and in the attic were found dry cholesteatomatous masses of a whiteish-yellow. The opening of the fistula into the abscess at the mastoid apex gave entrance directly to the inferior wall of the tympanic cavity.

April 24th. Thiersch's transplantation was done with a strip of skin taken from the exterior of the forearm. It proved a perfect success upon the anterior and inferior walls of the canal of the wound, upon the posterior wall the new tissue was ragged. In spite of the formation of the epidermis of the anterior and inferior walls of the canal producing adhesions, a new transplantation was made for the posterior wall. Politzer believes that the permanent opening of the canal of the wound in the mastoid process is the surest means to prevent the return of the cholesteatoma.

Urbantschitsch has employed in some cases the transplantation after the method of Siebenmann-Bezold. He has also made the transplantation in a case of cholesteatoma, and after twelve days of observation the success seemed complete.

ABSTRACTS FROM FOREIGN CURRENT OTOLOGICAL LITERATURE.

BY T. MELVILLE HARDIE, M. D.,
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THE TREATMENT OF TINNITUS AURIUM.

A valuable report upon this subject was presented by Drs. Miot and Herck¹ at the last meeting of the French Society of Otology and Laryngology.

The authors suggest the following classification:

I. Entotic or periotic noises, generally perceptible by both physician and patient.

II. Tinnitus proper, noises and sensations without apparent acoustic cause.

A.—Tinnitus due to a lesion of the auditory apparatus:

1. In diseases of the external ear.
2. In diseases of the middle ear.
3. In diseases of the internal ear.

B.—Tinnitus compatible with integrity of the auditory apparatus:

4. In diseases of the nervous system.
5. In mental diseases.
6. Reflex.

It is very generally recognized by otologists that treatment of the tinnitus alone is very often ineffective, and that a preliminary investigation into the cause of the trouble, whether depending upon systemic disease or a local condition, is not merely valuable but necessary. The diseases of the ear itself which frequently cause tinnitus are first considered; I. Tinnitus in affections of the external ear may be due to: (1) Hyperæmia of the soft tissues of the meatus and drumhead, or by reflex action on the muscles of the middle ear, on the branches of the auditory nerve, etc.; (2)

¹ *Rev. de Laryngol. d'Otologie, etc.*, 1, June, 1895.

obliteration or hyperæmia of the meatus by cerumen, etc., with consequent pressure on the drumhead and later on the perilymph and reflexly on the labyrinth; (3) inflammations of the external meatus, furuncle, parasitic otitis, syphilitic otitis, etc. The treatment in these cases is frequently effective.

II. Tinnitus in affections of the middle ear. In affections of the tympanic cavity and Eustachian tube the tinnitus may depend upon (1) an inflammatory condition of the mucous membrane capable of producing a hyperæmia of the labyrinth. This can be modified advantageously by cold applications and bleeding (leeches), by inflation of the middle ear and removal of secretion if any is present; (2) a subacute or chronic catarrhal condition with or without tubal obstruction. The patency of the tube must be restored if obstruction exists, absorption of the products of inflammation facilitated where possible by inflation of the middle ear and paracentesis followed by irrigation of tube, and tympanic cavity practiced when necessary. In narrowing of the Eustachian tube bougies may be employed; when its lumen is obliterated the cicatricial tissue may be destroyed with the galvano-cautery or it may be perforated, or a permanent perforation of the tympanic membrane produced; (3) in sclerosis or dry otitis media the best results are secured with the "masseur" of Delstanche, intra-tympanic injections (iodin in vaselin) and counter irritation (blisters) over the mastoid process. When the tinnitus appears to depend upon the existence of synechiae, retractions, ankylosis, the appropriate operation, as myringectomy, section of anterior or posterior fold, tenotomy of tensor tympani or stapedius, mobilization of the stapes, removal of one or more ossicles may be attempted, but the authors agree with the majority of otologists in believing that good effects, when secured at all, are not permanent. Among medicaments may be mentioned potassium bromid in large doses, particularly in neurasthenic cases, quinin alone or with iron, iodid of potassium (in syphilis); as instillations: hot water, ether, glycerin, particularly the last in extreme dryness of the drumhead and external meatus; hypodermically: morphin strychnin and pilocarpin; (4) when the tinnitus is due to an otorrhoea with persisting perforation the authors recommend the constant current, 6 or 8 milliamperes for five to ten minutes, the positive pole over the auricle, the negative at the back of the neck. Counter irritation over the mastoid is also useful but must be used with caution. (5) Noises having their origin in an affection of the tympanic membrane exclusively are comparatively infrequent and their extended

consideration may be omitted in this notice. Among the more important may be mentioned relaxation of the membrane in which collodion gives the best result, if there is not too great atrophy of the fibrous layers. If the atrophy is advanced artificial perforation may be tried. The noises co-existing with synechia and exaggerated tension are sometimes much lessened by the application of collodion. Surgical interference is sometimes necessary, but when the tension is due to retraction of the membrane in dry otitis media, has, as a rule, but a temporary effect.

III. Internal ear. The pathological conditions of the labyrinth causing tinnitus are anæmia, hyperæmia, extravasations of blood, inflammation and chronic lesions of the labyrinth. (1) Anæmia may be caused by general anæmia or be the result of aneurism of the basilar artery, atheroma of the internal auditory, etc.; (2) in hyperæmia the cause must first be determined. If there is cerebral congestion and redness of the face Leiter's tubes are indicated and a little later mastoid counter-irritation, intestinal derivatives, bromid and iodid of potassium, pilocarpin, galvanism applied to the upper cervical ganglion of the sympathetic. It must be remembered that the hyperæmia may come from the administration of quinin, salicylic acid, etc.; (3) in hemorrhages into the semi-circular canals, vestibule and cochlea, one may at first employ the means already suggested in hyperæmia, and when the active stage has disappeared, (third week), pilocarpin subcutaneously. In Menier's disease Charcot has used sulphate of quinin with benefit. This should be used for one fortnight only. In the treatment of (4) inflammation of the labyrinth occurring, *e. g.*, as part of a panotitis in scarlet fever and in (5) chronic hyperplasias and degenerations following hyperæmias, hemorrhages and inflammations of the part, but little of advantage can be suggested. The possibility of syphilis must always be considered.

IV. Tinnitus in diseases of the nervous system. Among the affections in which it may exist are arterio-sclerosis affecting the cerebral arteries, tumors, acute bulbar myelitis, tabes, cervico-occipital neuralgia, and in neuroses (epileptic and hysterical aura, neurasthenia, migraine).

V. Tinnitus in mental diseases.

VI. Tinnitus of reflex origin is unusual. Sufferers from stomach troubles, for example, have frequently a beginning sclerosis of the ear and the subjective sounds so frequently noticed in connection with uterine affections may often be attributed to the anæmia or neurasthenia of the patient.

PROCEEDINGS OF THE FOURTH MEETING OF THE GERMAN
OTOLOGICAL ASSOCIATION.*

THE FILLING OF DEHISCENCES IN THE TEMPORAL BONE BY FIBROUS MEMBRANES—AFFECTIONS OF THE RECESSUS HYPO-TYMPANICUS—LUCAE'S PRESSURE-PROBE AND RINNE'S TEST—POLYMYOSITIS INFECTIONOSA EX OTITIDE—HAEMORRHAGIC EFFUSIONS IN EAR FOLLOWING A PULPITIS—THE PATHOLOGY AND THERAPY OF OBJECTIVE TINNITUS—THE TREATMENT OF ACUTE PURULENT INFLAMMATION OF THE MIDDLE EAR AND MASTOID PROCESS—LEPTOMENINGITIS FOLLOWING ACUTE PURULENT OTITIS MEDIA—NEW METHOD OF COVERING LARGE DEFECTS IN THE BONE CAUSED OF OPERATIONS ON MIDDLE EAR AND MASTOID—METHODS BY OPERATION IN THE VARIOUS BRAIN COMPLICATIONS OF OTITIC ORIGIN—IRON, SILVER, LEAD AND MERCURY IN DISEASES OF THE EAR—SHALL WE BE CONSERVATIVE OR RADICAL AS REGARDS OPERATION IN ACUTE MASTOIDITIS?—AN UNUSUAL CASE OF OTITIS EXTERNA—THE PROPHYLAXIS AND TREATMENT OF PURULENT OTITIS MEDIA IN INFANTS.

1. Hartmann showed four preparations illustrating the filling of dehiscences in the temporal bone by means of a fibrous membrane. In two of the cases the substitution of membrane for bone occurred in the roof of the mastoid antrum, in one case in which death had resulted from sinus thrombosis the membrane was on the posterior surface of the temporal bone. In none of these cases was there union with the dura mater for which the membrane might be mistaken in operations. In the fourth case, the membrane replaced in part the bony tegmen tympani, a very unusual developmental anomaly.

2. Kretschmann discussed the varieties of otitis media purulenta which chiefly affect the inferior portion of the antrum named by him the recessus hypotympanicus. Its irregularities extend below the wall of the meatus externally, below the labyrinth on the inner side, below the Eustachian tube forward and posteriorly as far as the facial canal. Its very intimate relations with the internal carotid, jugular bulb and facial nerve give it a particular importance; exact diagnosis is only possible where the drumhead is absent either altogether or in its lowest part. The inflammation most frequently affects the posterior part of the recessus in which

* Held June 1 and 2, 1895, at Jena. Translated and abbreviated from the *Archiv. für Ohrenheilk.*, XXXIX, 2 u. 3, and *Monatschr. für Ohrenheilk.*, by T. Melville Hardie, M. D., of Chicago.

one may discover granulations or foul smelling pus. In many cases the patient complains of a feeling of tension about the middle of the sterno-cleido-mastoid which is aggravated by touching the floor of the recessus with a probe. Treatment consists in irrigation with the Hartmann curved cannula and cauterization with lactic and trichloroacetic acids. Kretschmann had exposed the recessus hypotympanicus in two operations on the mastoid which required removal of the posterior wall of the meatus.

In the discussion O. Wolf recommended his sharp curette which has a shank permitting of the rotation and use of the curette in any direction. In the discussion Hessler opposed the use of the curette through the external meatus on account of the possibility of causing facial paralysis. Walb suggested the use of the intra-tympanic mirror. Kretschmann thought it of no value in either diagnosis or treatment of the affection.

3. Lucae in examining forty-six cases treated by pressure probe in which the diagnosis between sclerosis and labyrinth affection was difficult, compared the results secured on treatment with the pressure probe on cases in which the Rinne test was positive, and negative respectively. The cases, twenty, in which Rinne was positive, with one exception, were much improved. Improvement was obtained also in those cases (8) in which Rinne was before the treatment negative, and after treatment positive, while of the remaining eighteen with Rinne constantly negative, twelve were improved and six not improved at all. The cases in which Rinne was positive had furthermore better perception of all musical tones, and he concludes that there was present in these a mild affection of the sound conducting apparatus without asserting that no labyrinth trouble existed. He mentioned two cases of undoubted labyrinth affections in which the pressure probe was of great use; in one patient a single use of the instrument noticeably improved the hearing for three months; the second was that of a girl, 3 years of age, who was completely deaf after meningitis. Eleven years later she could hear conversation with difficulty with the right ear; of musical tones the lowest were well heard, the medium high and higher comparatively well heard, C_4 and C_6 not heard at all. After a brief treatment with the pressure probe perception of C_4 returned, with coincident improvement for conversation.

4. Haug reported three cases of polymyositis infectiosa ex otitide. The abscesses were in the muscle substance and developed during the progress of an ordinary attack of acute purulent otitis media

without any general infection being present. In the first case metastatic streptococcus abscesses formed in the left deltoid, in the upper third of the left gastrocnemius, in the neighborhood of the left supinator longus, the right abductor magnus and the left masseter. Cure of ear and pyæmia in six weeks. In case II, the rigor occurred on the nineteenth day and the wrist joint next morning was swollen and painful; this disappeared, however. Three days later more pain in the ear; an exudation visible in Shrapnell's membrane was evacuated, but on the following day an abscess developed in the right forearm. Case III, in a girl 20 years old a traumatic rupture of drumhead was followed by an acute middle ear inflammation, perhaps produced by infective injections of oil and milk. At the end of the second week empyema of the mastoid. After operation the ear affection progressed normally. In the seventeenth week an abscess in the supraspinatus had to be opened; an infiltration on the deltoid disappeared of itself, but slowly, causing pain in the upper arm for a month afterwards.

5. Haug also gave the details of a case in which hemorrhagic effusions in the middle ear and in the external meatus followed a pulpitis of an upper molar. The pain in the ear followed the dentalgia in about eight hours. Nothing had been injected into the external meatus, the naso-pharynx was healthy, and no general disease was to be made out. Examination of the ear showed a typical "blood-blister" the size of a bean on the antero-inferior wall of the meatus, the drumhead was slightly reddened and its posterior half projecting and colored blue-red. On examination of the teeth a dark blue "blood-blister" could be seen filling the cavity of the next to the last left upper molar. Extraction of the tooth and simple closing of the external meatus resulted in complete *restitutio ad integrum*.

6. Kayser. On the pathology and therapy of objective tinnitus. These are vessel or muscle noises, the latter are either of entotic or tubar origin. Tonic contraction of the tensor veli palati produces the so-called autophony which may also come from scar contraction or the atrophy of inanition of the wall of the tube. It is in this way that noises produced in the naso-pharynx by breathing or speaking are conducted through the open tube to the ear. These may be stopped temporarily at least by smearing the mouth of the tube with vaselin introduced by a catheter; clonic jerkings of the tensor palati produce a peculiar crackling and clicking. Crepitation in the tube produced by the separation of its moist

walls is conducted to the ear and apparently produced there. With this are sometimes seen movements of the uvula and pharyngeal muscles, rarely of the tensor tympani. This variety is related to chorea and hysteria. Many therapeutic suggestions have been made. Pressure on the uvula over the mastoid, over the vagus have all been tried with varying success. In three cases Kayser secured good results from the introduction through a catheter of a bougie throughout the entire length of the cartilaginous portion of the tube. The treatment sometimes produces a lasting result. In the discussion Zaufal described his method of treating by massage, autophony and the various pathological conditions of the musculature of tube and palate. The finger in a "stall" of rubber is introduced into Rosenmüller's fossa, groove, strokes and presses, and is inserted into the mouth of the tube, presses the floor of the tube-mouth and the lateral wall downward and forward; finally the adjacent part of the soft palate is drawn downward with the hooked finger. If this fails he would do a tenotomy of the Salpingopharyngeus muscle.

7. Hessler. The treatment of acute purulent inflammation of the middle ear and mastoid process.

With pus in the middle ear it is only necessary to have a sufficiently large opening of the drumhead—by paracentesis if required. Irrigations do not remove the pus and are to be avoided in acute cases. The pus is removed with lightly rolled gauze or cotton pledgets, and the meatus must not be tamponed. The air douche is contra-indicated in the acute stage and may be injurious where catarrh of naso-pharynx, adenoid vegetations, etc., exist. The ear will frequently get well without special treatment if the naso-pharynx is properly looked after. Insufflations of boric acid are unnecessary and may be dangerous. In secondary involvement of the mastoid Hessler advises immediate operation; warm Preissnitz compresses are used only in simple catarrh of middle ear and mastoid; when pus is present, ice bags over the mastoid are to be used in the beginning only; counter irritation masks the true state of affairs, and for ten years past has not been employed. The typical Schwartze operation is done; all softened carious bone is removed. The opening in the bone varies between 5 and 8 mm. The wound is not irrigated but loosely tamponed with strips of iodoform gauze, tightly tamponed only when parenchymatous bleeding results from the operation. The bandage is changed in from one and one-half to three days, the secretion at the bottom of the cavity is wiped away with strips of sterilized gauze $1\frac{1}{2}$ to 4

cm. long. The meatus is not tamponed. Sterilized gauze is preferred for the later dressings. The patient leaves his bed on the third fever-free day.

Discussion. Panse would not permit the patient to cleanse the ear himself because of the necessity for asepsis. He loosely tampons the meatus with strips of iodoform gauze and drains the secretion into the dressing secured by a bandage, which is changed when necessary. Stacke avoids irrigation in acute trouble; also the forcible use of pledgets of cotton. His treatment consists in a sufficiently frequent change of dressing. After chiselling he tampons to the bottom of the wound to prevent any narrowing which might prevent accurate observation of the condition of the cavity. Brieger also opposed Hessler's method of allowing the cavity to close of itself. Healing should take place from the bottom so that there will be no retention of pus. Noltenius agreed with Brieger.

8. Joel. Leptomeningitis purulenta following otitis media purulenta acuta. In a child 3 years old an attack of measles was followed by purulent otitis media; mastoid empyema with typical operation. Five days later vomiting, fever, headache, paralysis of facial and abducens, obstipation, delirium. No changes in the fundus. Death nineteen days after the operation. Post-mortem showed extensive basilar meningitis; no carious spots on the inner surface of the temporal; the internal auditory meatus filled with pus. The only cause for the meningitis that could be suggested was an extension of the purulent process through the labyrinth probably after destruction of the membrane of one of the fenestræ. A second case was that of a boy 4 years old in which a meningitis resulted from an influenza which came on during a purulent affection of the middle ear.

9. Stacke. A new method of covering large defects in the bone caused by operations on middle ear and mastoid. The first incision is made along the attachment of the auricle, backward around the tip of the mastoid then upward as far as the linea temporalis. This flap consisting principally of skin is reflected upward. Another incision through the periosteum, but with its base at the mastoid tip is then made and the periosteal flap raised with a raspatory as far as the insertion of the sterno-mastoid and turned down. At the conclusion of the operation the two flaps are laid over the covered bone and there retained. If the periosteal flap is not large enough a third skin flap is made posterior to the original incision, this raised, the periosteum reflected and made to assist in

covering the cavity, the skin flap being replaced. In the discussion Kretschmann asked whether an atrophy of the transplanted portions could be prevented and whether there was not danger, on account of the length of the flaps, of their overlapping the epithelium lining the middle ear and so not uniting. Noltinius preferred Koerner's method. He, where possible, avoided the making of flaps. Stacke, in reply to Kretschmann said, that he advised flaps only long enough to cover the parts; that union took place in the middle ear as the attic and aditus were always so thoroughly curetted that no epithelium was present. He was astonished to hear from Noltinius that his cases operated upon with the Koerner flaps were completely healed in four to six weeks. The flaps didn't reach very deep and could hardly influence favorably the conditions in the wound cavity. He had hitherto always opposed a persistent retro-auricular opening, but where, as by this method, the time required for healing could be markedly curtailed he would favor it, and thought his method should be tried in appropriate cases. Siebenmann's method is not to be compared with his own since Siebenmann permits the cholesteatoma-skin to remain, and this is not a cure, but only a persistent prophylactic exposure of the diseased part to prevent later retention of its products. Zaufal thought that if the method did what was said of it, it was a great advance. Latterly it had been his custom to use Koerner's method, the chief advantage of which lay in the wide opening through the meatus secured by it, as one could so easily inspect the cavity. By it also one avoided the disagreeable retro-auricular opening. He had seen complete healing in six to eight weeks by the Koerner method. Koerner: The proposal of new methods showed that no one was suited to every case. The great advantage of his method was the short duration of healing necessary, on an average of seventy to eighty days. Brieger thought that the time of healing in the Koerner operation variable, as in other methods. In one case he had perichondritis auriculæ with a somewhat extensive necrosis of the cartilage. He thought, however, that the functional results were, as a rule, better than when a retro-auricular opening persisted. Panse claimed priority over Koerner in the description of the so-called Koerner flap-method.

METHODS OF OPERATION IN THE VARIOUS BRAIN COMPLICATIONS OF OTITIC ORIGIN.

10. Koerner. One cannot always speak positively as to the seat of the pus from the brain symptoms present. In the early history

of brain surgery only large abscesses situated in the temporal lobe could with certainty be diagnosticated. It was established post-mortem that almost all otitic abscesses of the brain were situated very near the seat of the primary collection of pus, in the ear or temporal bone. When the abscess is in the temporal lobe the tegmen tympani and tegmen antri are diseased and the evacuation of the abscess may be undertaken, as Koerner first suggested, at the same time that the diseased bone is removed. McEwen removes the superior wall of the meatus and the tegmen and so exposes the temporal lobe. Occasionally he makes an additional opening in the pars squamosa above the posterior margin of the meatal wall. Bergmann opens the middle cerebral fossa directly above the bony meatus; after cutting around, separating and turning down the upper half of the auricle, he elevates the dura, and easily and quickly reaches the tegmen, whence the pus can be sought for in every direction. Since surgeons have given up the old method of trepanation, and have endeavored to trace, from the primary focus the course of the infection, cerebral abscesses have been operated upon with greater success. Regarding the after-treatment there is considerable difference of opinion: McEwen uses drainage tubes which can be absorbed, others loosely tampon the cavity. Eulenstein made the observation that tamponing too tightly may cause a return of the cerebral symptoms. In very irregular cavities careful irrigation under artificial light is necessary to prevent retention of pus. Such retentions are often confused with second abscesses; at any rate, a second abscess in the immediate neighborhood of the primary one is frequently discovered post-mortem in patients who have been operated upon, while, when no operation has been done during life, only one abscess is found.

Jansen. It is important to know first the relative frequency of the various diseases in which intra-cranial collections of pus occur. In the Berlin clinic during the last three and one-half years in 184 hitherto unpublished cases, in which pus developed within the cranium, 148 were extra-dural abscesses, thirty-five thromboses of the sinus transversus, and five abscesses of the brain; cases of meningitis are not included. In the extra dural abscesses the pus was in the posterior cerebral fossa 161 times, in the middle thirty-eight times and in both fourteen times. Extra dural abscesses, therefore, are by far the most frequent complication of purulent otitis media, particularly of the acute form. These figures afford useful hints as to the method to be followed in cases of doubtful

diagnosis. In many cases where the abscess in the mastoid process, and the pus focus in the sinus, constitute practically a single abscess, a simple evacuation is all that is required. In other cases the following procedure is adopted: After opening the mastoid process and antrum the posterior bony wall is removed piecemeal with a straight chisel until the antero-lateral wall of the sinus appears. The sinus must, where possible, be exposed so far as it is diseased. Deeply-seated collections of pus are best reached after removal of the entire posterior wall of the mastoid process. This is effected most easily with long-bladed bone-forceps and quite small chisels. If the abscess extends to the jugular foramen, the sulcus transversus, and where necessary, a part of the floor of the posterior cerebral fossa are chiselled away. If the portion of the sinus wall first exposed is healthy, the posterior fossa must be so opened that the sinus and dura can be raised from the posterior wall of the temporal bone. If no pus is seen here, and symptoms pointing to a collection in the posterior fossa exist, Jansen recommends the laying bare of the upper knee of the sigmoid sinus with its horizontal continuation backwards. The opening of the middle cerebral fossa is best done from the upper half of the linea temporalis. If the inferior portion of the pars squamosa is removed, the entire upper surface of the pyramid can easily be inspected.

The deep-seated extra dural abscesses which follow a rupture through one of the semi-circular canals, or along the facial and superficial petrosal nerve, are nearly all produced by acute middle ear inflammation. To get at these it is necessary to open the middle cerebral fossa from the squamous portion of the temporal, and to remove the upper and posterior wall of the pyramid until the labyrinth is exposed. To prevent extension along the acusticus the opening of the vestibule must follow. From above and behind the posterior half or two-thirds of the superior semi-circular canal, and when required, the inferior in whole or in part, are removed with small straight chisels, and from behind the posterior half of the horizontal semi-circular canal when the vestibule is exposed.

In none of the cases of abscess of the temporal lobe, operated upon by Jansen, could an extension from the temporal bone to the brain be discovered, notwithstanding the fact that the situation of the abscesses was directly over the tegmen tympani. To reach them the posterior and upper wall of the mastoid was completely removed as far in as the labyrinth, which was untouched; then a portion of the pars squamosa and the tegmen are removed, and the parts are exposed on the median side as far as the opening of the Eustachian tube and the cochlea.

As a general thing the sinus can be laid bare in the method described above for abscesses about the sinuses. The thrombosed section is opened forwards and downwards as far as the jugular foramen if necessary, until one comes to an uncolored thrombus; posteriorly it is better to proceed several centimeters beyond the limit of the thrombus. Free drainage is guaranteed by the removal of the outer wall of the sinus. When it happens that the septic condition in the sinus transversus has not developed a solid thrombus, Jansen ties the jugular vein before doing anything further to the sinus. The facial vein is next tied and cut with a blunt-pointed knife as near the base of the skull as possible. Of twenty-five recent cases of thrombosis of the transverse sinus eleven cures were obtained; one after simple evacuation of abscesses about a sinus, eight after opening a thrombosed sinus, and two in which in addition the jugular vein was tied. In five cases of simple opening of the sinus, and four cases in which the jugular had also to be tied, death occurred.

Discussion—Brieger: It is undoubtedly correct to search for the brain abscess chiefly from the opened middle ear cavities. Where the symptoms are doubtful, however, it must be remembered that by this operation infection of the pia mater becomes possible. To obviate this danger he operated as follows in one case. Some time after the opening of the middle ear cavities, notwithstanding the fact that the dura in the middle fossa was exposed, he made a temporary resection in the pars squamosa and from this opening sought for the abscess in the direction of the first operation cavity. As he could find none he replaced the parts, and cure resulted in a short time without complications.

Kretschmann objected to the use of a sharp curette for evacuating the broken-down thrombus masses, since the bleeding would make probable a new infection when with the removal of the wall of the sinus in the entire extent of the thrombus one might wait for the spontaneous emptying of the diseased masses. Joel was strongly in favor of the opening of the cranial cavity after extensive operation upon the mastoid process. Hansberg asked Jansen whether he had seen prolapse of the brain after extensive operation in any of his cases. One of his own cases, a girl, 20 years of age, had had purulent otitis media dextra since childhood; for two years suffered from headache. Chiselling; attic carious; removal of ossicles; after two and one-half weeks severe headache, vomiting, choked disc, slowing of pulse. An opening was made in the pars squamosa, the roof of the meatus was removed as far as the tegmen tympani and

a large abscess, which lay directly above the pyramid, freely opened. Prolapse of the brain on the fifth day, in two weeks meningitis, which resulted fatally. Kümme! wished to know whether experiments had been made as to the most suitable place for puncture of abscess of the brain and as to the possible bad results which might follow numerous punctures into the brain substance. Kessel thought that the results of operative procedures upon the labyrinth went to disprove the existence of a sixth sense, as disturbances of equilibrium had not been reported in any case; the clinical symptoms occurring could all be referred to the ventricle. Koerner, referring to the question as to diagnostic puncture, said that the abscess was frequently missed, in one case reported only the ninth puncture reached the abscess. Much might be learned as to their position from the post-mortem table. Punctures are to be made through healthy dura to prevent the conveyance of infection into the brain substance. In his reply Jansen said that as the sharp spoon was used only in the septic broken-down part of the thrombus, it could not do any harm. He had seen prolapse of the brain in all cases of cerebral abscess; in his opinion there was a greater tendency to gangrene when the incision was small and the opening in the dura insufficient. With large incisions the prolapsed portion became rapidly covered with granulations. A prolapse can only cause meningitis through pus retention, *e. g.*, by incompletely opened extra dural abscess or by gangrene of the prolapsed portion. He had seen no ill effects from the use of the trocar. The canal made shortly disappeared. To Kessel he replied that his operations on the labyrinth concerned for the most part those in which the physiological function was already destroyed by the pus and granulations. In these, dizziness and nausea were often present. When a healthy labyrinth was injured dizziness, nausea, vomiting, and nystagmus almost invariably occurred. Zaufal recalled a case in which the trocar had caused not only a meningitis, but a linear brain abscess which corresponded in thickness with the trocar which had been used.

IRON, SILVER, LEAD AND MERCURY IN DISEASES OF THE EAR.

11. O. Wolf. Iron is of considerable value in those trophic disturbances of the auditory nerve which are often present in anemia and chlorosis. Lead poisoning with its symptoms of dizziness, tinnitus, and slow but constant decrease in hearing power,

may be quite difficult of diagnosis. Wolf presented a report on a series of cases of lead intoxication, which in the acute stage caused probably a serous exudation in the labyrinth which could be re-absorbed before degenerative changes took place in the cochlear nerve fibers, but which in the chronic stage caused a degeneration of the acusticus. While acetate of lead is of value in eczema of the external ear and meatus it should not be used in otitis media purulenta, as the secretion is not permanently lessened and deposits of lead albuminate and sulphate are formed which are difficult of removal. Silver nitrate does not stop the discharge permanently, and used as a hair dye may cause disturbance of hearing; for example, subjective noises. Mercury may, like lead, cause acute labyrinth troubles. A 1% solution of sublimate alcohol is valuable in chronic otorrhea. Wolf has seen but little benefit result from mercurial inunctions in syphilitic affections of the ear. An interesting case was cited. A girl, 14 years of age, who suffered from an exudation in the knee-joint was also almost blind and deaf. She had, in the five weeks previous to coming under his observation, received fifty mercurial inunctions of 3 grammes, with sight and hearing becoming less all the time. Under iodine-ether injections through the Eustachian tube, painting of mastoid and knee with iodine, pilocarpin injections and potassium iodid internally the hearing was improved. Hearty consumption of meat was followed by a very large panniculus adiposus, and at the same time a lessening of seeing and hearing ability. After taking a Kneipp cure for eight weeks she was greatly improved in every way.

Discussion: Szenes. Great benefit was derived in acute eczema, particularly at the beginning, from cold applications with lead water or Goulard's lotion. When this stage is past, the treatment should be with ointments. He agrees with Wolf as to sublimate alcohol. In very sensitive individuals one may first instill a little of a 50% cocain solution.

Stimmel has used with success sublimate alcohol in acute and chronic purulent otitis: in the acute cases he waits until the inflammatory symptoms have lessened. An improvement is its use alternately with a 2% solution of resorcin. He considers the careful use of the Politzer air bag not injurious. His results with mercurial inunctions differ entirely from those of Wolf.

Reinhard employs inunctions in syphilis of the internal ear, but combines with it pilocarpin injections.

**SHALL WE BE CONSERVATIVE OR RADICAL AS REGARDS
OPERATION IN ACUTE MASTOIDITIS?**

12. Szenes asks whether we shall be conservative or radical with regard to operation in acute cases of mastoid inflammation, and pleads for the "goldene Mittelstrasse." His inclinations, however, if one may judge from the general tenor of the paper, are strongly conservative. As an illustration of the progress of a mastoid empyema under conservative treatment, Szenes describes a case of acute otitis media purulenta in which, notwithstanding paracentesis, leeching and antiphlogistics, the characteristic symptoms of mastoid empyema supervened. No operation was performed, but cure, nevertheless, resulted; the perforation in the drumhead closed in twelve weeks.

AN UNUSUAL CASE OF OTITIS EXTERNA.

13. Szenes also describes an unusual case of otitis externa. A nurse infected herself from a vaccine pustule on a baby's arm. The meatus was filled with fetid pus and diffusely swollen; the drumhead was not affected. At the end of three weeks a smallpox scar could be seen on lower wall of the external meatus.

**THE PROPHYLAXIS AND TREATMENT OF PURULENT OTITIS
MEDIA IN INFANTS.**

14. Walb. Treatment consisted in the removal of secretion with the Politzer bag. Prophylaxis: recognizing the frequency of infection from the nose, Walb considers of particular importance a cleansing of the nose as soon as possible after birth. With this he uses inflation of the ear with a small bag; the second nostril is not to be closed. If infection already exists inflation is to be performed with the other nostril closed.

Hartmann recommended the dry removal of the secretion. If this was ineffectual the cleansing could best be done with peroxid of hydrogen in solution.

Bechmann was not in favor of the air douche as recommended by Walb.

Zaufal, while recognizing the usefulness of Walb's procedure, was strongly opposed to its general employment.

ABSTRACTS FROM CURRENT AMERICAN AND
ENGLISH OTOLOGICAL LITERATURE.

By LEONARD A. DESSAR, M. D.,
OF NEW YORK.

THE PRIME EFFECT UPON THE EAR OF NASAL STENOSIS

Dr. B. Alex. Randall (*Medical Examiner*, August, 1895) states that in many cases where the ear is stopped up for a longer or a shorter time as an early effect of a coryza, there is present no stenosis of the Eustachian tube or filling of it with secretion. The drumhead may be devoid of the faintest congestion or other abnormality, unless visibly pressed inward; the tube-mouths may be neither swollen nor clogged with secretion; inflation by the Valsalva or Politzer method is usually very easy; and yet the discomfort and impaired hearing is often quick to return after momentary relief, with nothing but nasal stenosis to account for it. This obstructive condition is almost invariably anterior, perhaps not extending anywhere near the tube-mouths, and may be vaso-motor rather than truly inflammatory. The same symptoms may be met in more severe and extensive cases where the causes above named may share in its production, or be less easy to exclude.

OTITIS MEDIA AS A COMPLICATION OF PNEUMONIA.

Dr. F. P. Ball (*Medical News*, September 21, 1895) reports three cases of otitis media complicating catarrhal pneumonia in children, and attended with very marked and decided cerebral symptoms. He believes that this complication of pneumonia has been quite frequently overlooked because the symptoms are referred to the brain instead of the tympanum, and that its importance is quite as often not appreciated. The cases reported illustrate the close relation between the pneumonia and the otitis media; the symptoms of the latter so much resembling meningeal inflammation that a differential diagnosis was exceedingly difficult.

Although all the symptoms of meningitis were present, viz: the headache, vomiting, delirium, restlessness, fever, coma and deafness, there was, in reality, no inflammatory action in the cerebral meninges whatever. In two of the cases the symptoms of meningitis subsided immediately on the relief of pressure by the liberation of the pus from the tympanic cavity, and in the other case practically the same thing occurred, probably by discharge through the Eustachian tube. The author, therefore, thinks it quite evident that in these cases the condition is not due to inflammation of the meninges, but is the result of pressure within the tympanic cavity upon the sinuses and veins, and that it is relieved instantly when the pressure is removed. An examination of the ear with a head-mirror and speculum is the most important, and probably also the only certain method of making a diagnosis, and this assists very materially, not only in the diagnosis, but also in the treatment of the case. As it is known that there may be invasion by the pathogenic bacteria of the tympanic cavity in pneumonia, tuberculosis, etc., as well as the exanthematous diseases, it seems to him it would be a wise precaution to use antiseptic throat washes in these cases, also in order to prevent what might become a serious complication. The prognosis depends a good deal on the plan of treatment, or on the success of the efforts of nature at liberating the exudate confined within the tympanic cavity. If the pus is discharged, either by perforation of the drum or through the Eustachian tube, relief is speedy and recovery quite sure, unless this fortunate circumstance is too long delayed. If the pus is not liberated, death may result from the pressure on the cerebral vessels, or there may be burrowing of the pus, resulting in meningitis and death. Hot douching of the ear, inflations through the Eustachian tube, and at the proper time the liberation of pus by surgical means, are recommended.

ACUTE ATTICAL DISEASE.

An interesting article on this subject was read by Dr. J. O. Tansley before the American Otological Society, July 16, 1895 (*Medical Examiner*, September, 1895). He strongly advocated early free incision into the tissues overlying the attic as soon as those tissues are seen to be markedly reddened, without waiting at all for bulging, claiming in this way to promptly cure many cases which would otherwise run into mastoiditis. Dr. Tansley also showed a bandage useful for retaining in place the dressings after double mastoid operations.

MASTOID OPERATIONS IN DIABETES.

Dr. Buck reported a few cases before the American Otological Society, July 16, 1895 (*Medical Examiner*, September, 1895), and quoted some statistics which made clear two facts: (1) The prognosis of mastoid operations in diabetics is much more grave than in uncomplicated cases; and (2) that nevertheless we can by early operation, save a good proportion (more than 50 per cent) of such cases.

DEAFNESS FROM INTRA-NASAL DISEASE

Dr. John A. Thompson, in a paper read before the Ohio State Medical Society (*Jour. Am. Med. Ass'n.*, August 24, 1895) cited the conclusions of Swineburne, who, on the ground of careful examinations of the nose and throat in 1,000 cases of deafness, stated that in 95 per cent of all cases the primary lesion is in the nose or naso-pharynx. The manner in which disease in these organs produces chronic inflammation in the tympanic cavity has been a question of dispute. Some assert it is due to the direct extension of inflammation by continuity of tissue. Others have thought we could trace the resultant ear disease, secondary to obstructive lesions in the upper respiratory tract, to imperfect aeration of the middle ear. Still others have thought that the interference with the circulation in the internal and middle ear by the inflammatory and neoplastic changes in the nose or nasal pharynx, was the cause of the secondary disease. The author thinks it probably that each method plays a part in the production of secondary diseases in the middle ear, but has encountered some cases which suggest that there is a relation, not yet understood, between the healthy condition of the nose and naso-pharynx and the sense of hearing. In the three cases reported by him there had been a serious and irremediable impairment of the organ of hearing, yet in all, the ability to hear has been greatly increased by restoring the nose and throat to their normal condition.

VIBRATORY TREATMENT FOR DEAFNESS.

In a paper read before the San Francisco County Medical Society, May 14, 1895 (*Occidental Medical Times*), Dr. E. S. Clarke stated that good results may often be obtained by vibratory treatment when other methods have failed. The cases benefited are not confined entirely to those having catarrhal affections, for those where the drum membrane has been destroyed by chronic

otorrhea are considerably improved. For producing continuous vibrations he prefers an ordinary guitar firmly attached to a stand with a movable electric vibrator adjusted to strike any desired string. The range of vibrations are in this, from 80 to 320 per second and can be increased to 1,000 per second by use of frets. The strings he has found most effective, however, are those vibrating 80 to 160 times per second, though this varies considerably in different individuals. As to the volume of sound required in any particular case, he has been unable to determine, unless it be that other things being equal, the greater volume the better the result obtained.

THE PREVENTION OF MASTOID EMPYEMA.

Dr. Charles H. Burnett, in a paper presented at the meeting of the American Otological Society, July 16, 1895 (*Medical News*, August 17, 1895), points out that the proper treatment of an acute otitis media is largely negative, after either spontaneous or artificial opening in the membrana has occurred, and a discharge set in. He advises that all forms of inflation of the tympana should be carefully avoided in this disease, not only for the welfare of the ear already infected with pathogenic germs, but also in order to avoid forcing similar germs into the, as yet, unaffected ear. He does not believe that it is possible to abort an acute otitis media excepting by a paracentesis of the membrana in the early congestive stage. In acute otitis dry heat will never do any harm and may give relief. As soon as the membrana is perforated and a discharge sets in, or even before this takes place, immediately after paracentesis, we should urge the medical attendant to insert simply a strip of iodoform gauze or carbolic acid gauze an inch and a half long by a quarter of an inch wide into the auditory canal for antiseptic drainage purposes, place a tuft of the same gauze in the concha, and let the ear alone for twenty-four hours, when the same kind of dressing may be re-applied if the previous dressings are moist, or let alone for twenty-four hours longer if they are dry. At no time does the author syringe the acutely inflamed ear or put anything into it but the dressing mentioned, and he finds that the middle ear heals rapidly and the perforation closes. We should strenuously diffuse the idea that all insufflations, moppings, syringings and instillations, of anything, will now be irritant to the membrana and middle ear, and tend to bring about secondary infection. In his experience an acute otitis media properly treated is never followed by mastoid involvement, or a continuance of discharge from the ear, but gets well in five or six days.

AN ELECTRIC PRESSURE SOUND FOR THE DIRECT VIBRATION OF THE MEMBRANA TYMPANI.

Dr. John C. Lester, (*New York Med. Jour.*, June 8, 1895). After referring to the papers of Braun,¹ Laker,² Freudenthal,³ Black,⁴ and more especially of Lucae,⁵ who first employed and devised an instrument for the mechanical treatment of chronic diseases of motion in the conducting apparatus of the acoustic organ, the writer gives the following description of an instru-



FIG. 1.
Motor and pressure sound in position.

ment devised by himself, which has proved more than satisfactory in those cases of impaired hearing and tinnitus, which are directly traceable to some defect in the conducting apparatus of the ear:

¹ *Verhandlungen des 10. Internat. Med. Cong.*, Berlin, 1890.

² *Die Heil-Erfolge der inneren Schleimhautmassage*, Graz, 1892.

³ *Internal Massage in Diseases of the Nose and Throat. Med. Record*, Vol. XLVIII, No. 1.

⁴ *New Instrument for Vibratory Massage of the Nasal Mucous Membrane, N. Y. Med. Jour.*, Vol. IX, No. 25.

⁵ *Archiv. für Ohrenheilkunde*, Band XXI, 1884.

"In the first illustration (Fig. 1) the instrument is shown in position. As will be seen, the head of the patient is turned slightly toward the opposite side as for an ordinary examination of the middle ear, and firmly fixed in this position. An ordinary round ear speculum is introduced, and the canal illuminated in the usual manner. The motor with pressure sound attached is shown in Fig. 2. The right hand grasps the handle of motor with the thumb resting on the button of the contact spring. The corrugated handle B (Fig. 3) of the pressure sound A (Fig. 3) is firmly held between the thumb and index finger of the left hand. The tip of the little finger is made to rest gently on the head of the patient immediately behind the auricle, and the sound is introduced parallel to the anterior superior wall of the auditory canal until the cylindrical extremity of the spiral end D (Fig. 3) rests upon the base of the short process of the malleus. The short pro-

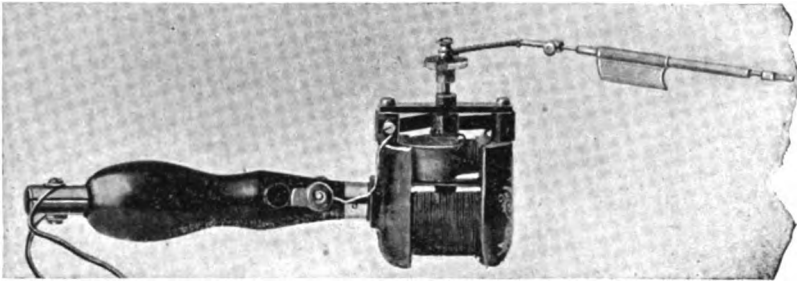


FIG. 2.
Motor with pressure sound attached.

cess of the malleus is selected as the point of contact, as it has been demonstrated by Lucae⁶ that 'if the malleus is still movable, more or less free movements are seen at once to take place in the whole drum membrane, which in the majority of cases, correspond to the movements of the short process—*i. e.*, occurring inward on pressure upon the latter, and outward on removal of pressure.'

"When contact is made with the pressure button before referred to, vibration ranging from five hundred to fifteen hundred or more a minute, judging from the note obtained from the revolutions of the armature, are produced. The extent or length of the vibrations is thoroughly controlled by the eccentric throw G (Fig. 3)

⁶ *Archiv. für Ohrenheilkunde*, Vol. XXI, p. 84.

and the binding screw H (Fig. 3), the range being from zero to half an inch.

"In the cases so far treated the best results have been obtained by a minimum length or extent of vibrations and a maximum number of vibrations.

"The duration of treatment varies, the average being from three to ten seconds at each sitting, and should be repeated from two to three times a week."

Following the description of the instrument the author presents the histories of several cases treated by direct massage of the drum

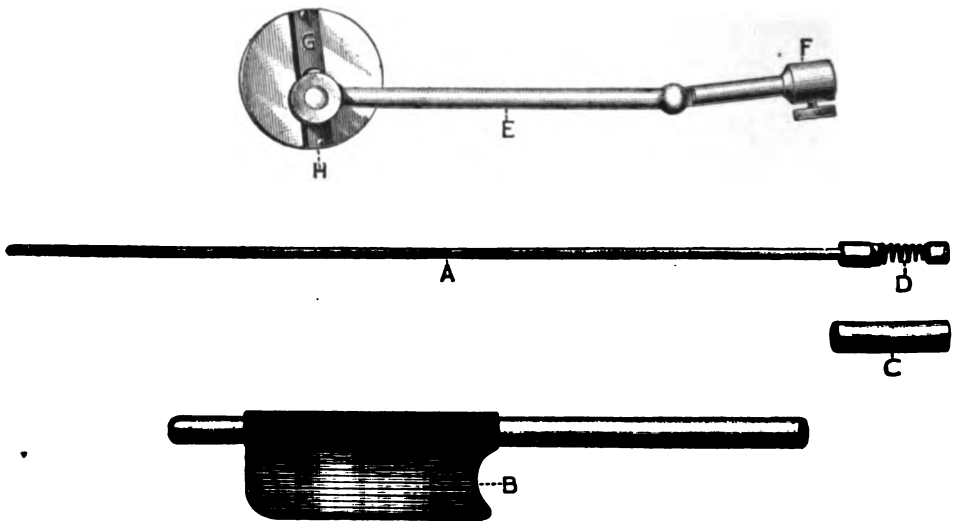


FIG. 3.

G, eccentric throw; H, stud and sleeve with binding screw; E, adjustable connecting rod or shaft; F, receiving socket with binding screw for pressure sound; A, pressure sound and spiral spring (D); C, protecting cap for spring when not in use; B, corrugated handle and tube.

membrane, in which other methods of treatment had been persistently employed with little or no benefit.

From the published cases and others under treatment, the writer feels justified in the following conclusions:

"That in the mechanical mobilization of the ossicles by vibratory massage we have an agent of undoubted value in chronic and subacute affections of the middle ear. That the therapeutic value of this method depends largely on the rapidity and amplitude of the vibrations.

“That it is a safe method of treatment in all cases of impaired function due to some defect in the conducting apparatus. That it is of especial value in sclerosis and in atropic conditions by virtue of its action in increasing the vascularity and hence the nutrition of the part.

“That in hypertrophic otitis media this method is safer and to be preferred to the pneumatic method of Delstanche, which is unsafe and in many cases positively harmful.

“That it is a method easy of application, causes little or no reaction, and is unattended with pain or discomfort to the patient.”

ABSTRACTS FROM CURRENT NEUROLOGICAL LITERATURE.

BY WENDELL REBER, M. D.,
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OCULIST AND AURIST TO THE CHILDREN'S HOME—LATE JUNIOR RESIDENT
PHYSICIAN STATE HOSPITAL FOR INSANE, NORRISTOWN, PA.—FORM-
ERLY CLINICAL ASSISTANT WILLS EYE HOSPITAL; ALSO TO
THE EYE DEPARTMENTS OF THE PRESBYTERIAN AND
ST. AGNES HOSPITALS, PHILADELPHIA, PA.

PROGRESSIVE MUSCULAR ATROPHY INVOLVING IN ITS LATER STAGES THE EXTERNAL OCULAR MUSCLES.

J. T. Rugh and C. K. Mills (Philadelphia) report the case of a married woman, 35 years of age, who, for thirteen years, had been the subject of progressive muscular atrophy. The right shoulder was first affected, and gradually lost its function. Later the muscles of the left half of the face became atrophic. Now, involvement of the ocular muscles is evidently beginning. In looking both outward and inward, the excursion of the left eye is incomplete, and in looking upward it has a tendency to wander outward. Some restriction of movement inward is also observable in the right eye. It is probable that the impairment is of conjugate ocular movement to the left. Pupils respond to light and accommodation. The authors, in concluding, remark that the case probably belongs to the family of progressive muscular degenerations. It is unusual in having begun in the rhomboid and scapular muscles, and in remaining most marked in them, and for the long period of time elapsing between the two attacks of pain due to the atrophic condition. (*Journal Nerv. and Ment. Dis.*, June, 1895.)

THE DIFFERENTIAL DIAGNOSIS OF TRAUMATIC INTRA- CRANIAL LESIONS.

Dr. Charles Phelps, after an exhaustive and critical consideration of the above subject from a practical point of view, states full conclusions, from which we extract the following:

The pupillary condition in intra-cranial hemorrhages usually suffers some change, but none which is characteristic. Every possible combination of contraction, dilatation and normal condition is associated with every variety and situation of hemorrhage with the single exception that contraction of one pupil never occurs without some changes in its fellow. Dilatation in some combination is more commonly observed than contraction, but not more frequently upon the side of the effusion than upon the opposite side, and not more especially with one type of hemorrhage than with another. In complicated hemorrhages dilatation of both pupils is more common; and the effusion is more frequently bilateral than in some simple cases. In unilateral effusion, dilatation is more likely to be on the corresponding side. A normal condition of the pupils is compatible with every variety of hemorrhage wherever situated, whether simple or complicated. (*New York Med. Jour.*, January 12, 1895.)

A CASE OF SUBACUTE NUCLEAR OPHTHALMOPLÉGIA WITH PARALYSIS OF THE EXTREMITIES.

Kalischer (in the *Zeitschrift für Nervenheilkunde*, Vol. VI.) records the following case with post-mortem findings:

Male, 64 years of age, of good family and personal history, developed without apparent cause (except possibly sorrow, anxiety and misuse of tobacco), first, a right-sided ophthalmoplegia, with associated diplopia, and soon after a similar condition on the left side. In a few days the external eye muscles became paralytic, while the internal muscles which in the beginning were entirely free became paretic. General disturbances, such as fever, headache, optic neuritis, vomiting, vertigo, stupidity, etc., were entirely absent. The other cranial nerves were unimpaired except for a slight weakness in the internal portion of the right facial. About this time there developed a symmetrical facial paralysis which went on to paralysis of the extremities. After a period of progression all the symptoms became stationary, and there was a remission. Especially in the morning and after a rest during the day, the paralysis would be much improved. Four months later death occurred rather suddenly from respiratory paralysis. Autopsy twenty-two hours after death showed no evidence of arterial degeneration at the base of the brain. Microscopical examination disclosed normal optic chiasm, optic nerves and nerves going to supply the ocular muscles. There was no increase in interstitial tissue in the nuclei of the nerves to the external ocular muscles.

[The fact that the optic nerves as far back as the chiasm, and the nerves going to the external ocular muscles were normal, suggests that the origin of the ocular disturbance was some structural changes in the nuclei of the third, fourth and sixth nerves. W. R.]

THE DISTURBANCES OF SENSIBILITY OF THE GLOBE OF THE EYE AND ITS APPENDAGES IN LOCOMOTOR ATAXIA.

Berger (*La. Med. Mod.*, November, 1894) in opening his subject states:

"The disturbances of sensibility of the skin in locomotor ataxia are well known, but those of the visual sphere seem to have escaped the notice of authors up to the present time. In the area of distribution of the trigeminal nerve some diagnostic importance has been attached to anesthesia of the pharynx and periorbital anesthesia of the skin, which latter is found in certain cases of tabic atrophy of the optic nerve."

After comprehensive clinical histories of five cases, he concludes that:

"In locomotor ataxia various troubles may develop in the eye and its appendages. Thus, in the cornea there is a diminution of sensibility; in the conjunctiva there is partial anesthesia to the touch and temperature, also impaired localization. The skin of the lids may show disturbance of localization. The surrounding parts of the eye may also be impaired, there being present periorbital cutaneous anesthesia, also disturbances of the faculty of localization over the forehead, temples, cheek and nose."

He summarizes as follows:

"1. There is no relation between the symptoms above enumerated and atrophy of the optic nerve of tabic origin, there being cases in which the latter is present with no disturbance of sensibility of the eye and its adnexæ. On the other hand these anomalies of sensation may be present in a tabetic with the co-existence of optic atrophy.

"2. The presence of disturbances of sensibility and localization above referred to, if found in a case of optic atrophy point to the tabic origin of the optic nerve degeneration."

INTRA-CRANIAL GUMMA(?) WITH OCULAR SYMPTOMS.

At the May meeting of the New York Neurologic Society, Dr. C. E. Nammack presented an instance of suspected intra-cranial gumma, during the discussion of which, Dr. Sachs and Dr. Starr

spoke of the cautions to be observed in making the diagnosis of gumma. They had seen cases improve vastly on specific treatment that subsequently were proven of an entirely different character. During the same discussion, Dr. J. F. Terriberry remarked that "one could get no idea of the degree of choked disc from the impairment of vision." (*Journal Nerv. and Ment. Dis.*, July, 1895.)

HYSTERICAL AMBLYOPIA AND AMAUROSIS.

Dr. J. Arthur Booth's (Brooklyn) conclusions drawn from five comprehensive case histories of hysterical amblyopia are sufficiently interesting to warrant full quotation:

Amblyopia or amaurosis from hysteria may be slight in form and transitory in duration, or very severe; sometimes tardy in its progress and prolonged in its existence. If the condition should persist for any length of time and an alteration of nutrition or any morbid formative process be set up by prolonged functional disturbance, then it is probable that finally the condition would change into an amaurosis from inflammation and congestion.

The diagnosis is based on two points: The absence of any demonstrable changes in the eye, and the lack of that agreement between the individual symptoms constituting the disturbance of vision, which under other circumstances they would exhibit. In addition to the usual therapy, he urges hypnotism. He remarks, "a great many of us are prone to look upon this entire subject as either belonging to the domain of quackery or believing that it requires some special power, and thus hesitate to take advantage of this method of treatment. The time has now passed for any such argument, and any physician who would take the trouble to study the subject would obtain satisfactory results in a certain number of cases. The manner of procedure in producing hypnosis is given in detail in current literature, so that it does not seem necessary to dwell upon this part of the subject here except to state that the fixation method is the one generally employed."

Conclusions:

1. We possess in suggestive therapeutics an important aid in the treatment of certain morbid conditions, but just how valuable this may be cannot be estimated until it is more generally used and the results reported.

2. The results of this method or treatment are sufficient to stimulate the profession to further use of it.

3. Instead of waiting and trying other methods first, thus allowing the disease to exist for a certain time, I would recommend trial by hypnotism in the first place.

4. The use of hypnotism by the intelligent physician in the cure of certain morbid conditions does not produce any bad effects, notwithstanding reports to the contrary. (*Journal Nerv. and Ment. Dis.*, August, 1895.)

TABES ARRESTED BY BLINDNESS.

Dejerine has been investigating the above subject. He quotes Benedikt, to whom he ascribes the credit of first pointing out the correlation between tabes and optic atrophy; also the fact that in these cases, with and by the appearance of said atrophy, the development of tabes became arrested. Benedikt further asserted that whatever stage the tabes had reached, the motor disturbances characteristic of tabes receded as soon as the disease complicated itself with atrophy of the the optic nerves.

With the latter statement Dejerine cannot agree. According to his experience, the optic atrophy, if it does complicate the disease, sets in at an early stage, viz., before the disturbances of motor incoördination have made their appearance. He thinks that when the motor incoördination is once established the patient can be nearly assured that he will not become blind.

"The optic atrophy is most likely to appear soon after the lancinating, lightning-like pains are felt. With the development of blindness these pains nearly always diminish in intensity and frequency to disappear entirely in some cases.

"In a few cases the lancinating pains and the amblyopia are contemporaneous. In a third class, only the blindness is present. In these cases we probably have to deal with tabetics in whom the the tabic process has involved only the eyes. The fact that in some such cases lancinating pains set in years afterward (Gowers), with later pathologic findings demonstrating lesions of initial tabes, proves clearly that we have before us a special clinical form of tabes."

In conclusion he records the peculiar fact that sometimes the knee jerks after having been absent for years, appear again when blindness occurs. (*Gaz. degli ospetali e delle Cliniche*, 1895, No. 46.)

THE COMPARATIVE PATHOLOGY OF THE NEGRO IN
DISEASES OF THE NOSE, THROAT AND EAR,
FROM AN ANALYSIS OF 11,855 CASES.*

By W. SCHEPPEGRELL, A. M., M. D.,
OF NEW ORLEANS, LA.

ASSISTANT SURGEON EYE, EAR, NOSE AND THROAT HOSPITAL, NEW ORLEANS.

THE comparative immunity of the negro from many of the diseases of the nose, throat and ear has impressed me for a number of years. This fact, of which I have been cognizant in a general way from the examination of a very large number of cases, has been emphasized by a careful analysis which I have made of a series of 11,855 cases which were examined in the throat department of the Eye, Ear, Nose and Throat Hospital of this city from January 1, 1892, to April 20, 1895.

The Eye, Ear, Nose and Throat Hospital offers unusual facilities for the study of the comparative pathology of the negro in diseases of the nose, throat and ear. Being the largest special hospital in the world that is located in a section where the negroes are sufficiently numerous to offer a fair comparison, the study of these cases will offer a great deal of interest.

The population of New Orleans, according to the last United States census (1890), consists of 177,376 whites and 64,663 colored. While this shows the white population to be almost three times as great as the colored, still this is offset by the fact that the colored population, as far as diseases of the nose, throat and ear is concerned, are very extensive patrons of free clinics. Among the whites, in spite of the fact that free hospital privileges are excessively abused here as in other

* Read August 11, 1895, before the Orleans Parish Medical Society.

cities, still probably not more than 25% are subjects who take advantage of free clinics, while with the negro, this contingent is over 70%.

This estimate makes the number of those who would visit a free clinic, if suffering from the ear, nose or throat, 44,344 and 44,264 for white and colored respectively, or approximately equal for both.¹

One point to which I would call attention is that when the word *negro* is mentioned in this paper, this term is not restricted to the pure African type, but as opposed to the term white, and known commonly as "colored."

The following tables, which I have collected, shows the number of cases of the diseases designated in 11,855 cases, the first column being the number of whites affected, the second of colored, and the third column the number of negroes affected to 100 whites:

A superficial examination of these tables demonstrates the much larger proportion of whites than negroes as regards the diseases of the nose, throat and ear. This is especially noticeable in the so-called "post-nasal catarrh."

This affection, which is so common in America that it has been estimated that almost every other person is affected with it to some extent, a fact so well known that European writers often refer to it as the "American catarrh"—this affection is present in the negroes only 12 times to 100 in the whites. This fact has impressed itself on every one who has much experience in the free clinics of this city where throat diseases are treated.

In chronic suppurative and non-suppurative inflammations of the middle ear, the ratio of the negro is also small, being 16 and 26 respectively to 100 cases in the whites

In the diseases of the nose, we also find a proportionately small number of negroes affected, and in this fact, in my opinion, lies the secret of the comparative immunity of the negro from diseases of the ear and throat. Laryngologists and aurists are almost unanimous in attributing the greater number of cases

¹ The hospital is also attended by numbers of patients from the adjoining country; but as the proportion of white and colored in these is about the same as in the city, this will not affect the ratio here stated.

GENERAL TABLE.

	Whites	Negroes	Number Negroes to 100 Whites
Diseases of the mouth and tongue.....	388	156	42
Diseases of the fauces, pharynx.....	2,717	747	27
Diseases of the larynx and trachea.....	347	108	31
Diseases of the œsophagus.....	35	4	11
Diseases of the neck.....	128	109	85
Diseases of the nose and accessory cavities.	2,483	571	23
Diseases of the ear.....	3,029	788	26
Miscellaneous diseases presenting symptoms in ear, nose and throat.....	167	78	47

SPECIAL TABLE.

	Whites	Negroes	Number Negroes to 100 Whites
Epithelioma of mouth, throat and nose.....	16	11	69
Tubercular laryngitis.....	95	34	35
Luetic affections of the mouth, nose, throat	15	4	27
Hypertrophy of faucial tonsils.....	635	119	18
Hypertrophy of pharyngeal tonsils.....	982	219	22
Hypertrophy of lingual tonsils...	234	64	27
Elongated uvula.....	56	43	76
Rhinitis, hypertrophica and intumescens...	806	204	25
Rhinitis, atrophica fetida.....	126	41	32
Rhinitis, atrophica simplex.....	225	55	24
Rhinitis diphtheretica.....	6	0	0
Deformed septum.....	568	57	10
Perforating ulcer of septum.....	13	2	15
Nasal polypi (myxomata).....	63	10	16
Rhino-pharyngitis chron (post-nasal ca- tarrh).....	322	40	12
Lymphadenitis cervicalis.....	88	80	91
Bronchocele (goitre).....	31	39	126
Basedow's disease (exophthalmic goitre)...	5	4	80
Chronic non-suppurative otitis media.....	914	245	26
Chronic suppurative otitis media.....	663	108	16
Acute catarrhal otitis media.....	69	39	56
Acute otitis externa.....	179	37	21
Impacted wax.....	447	107	24
Mastoiditis.....	12	3	25
Deaf-mutism.....	16	1	6
Keloid tumor of lobe of ear.....	1	7	700
Diphtheria.....	6	8	133

of diseases of the throat and ear to some morbid condition in the nose, which inhibits the functional activity of this organ. In the whites, especially where exposed to the dust and other impurities of the air in large cities, and also to the sudden changes so frequent in our section, some congested or hypertrophied condition of the nasal mucosa is very common. The nasal septum also is so often found deformed in some manner in the white patient, that a perfect septum forms the exception. These conditions are frequent causes of diseased conditions in the ear and throat.

The broad patulous nostrils of the negro, however, appear to offer a certain protection against these atmospheric irritations, and congested and hypertrophic conditions in the nose are much less frequent (25 to 100 whites), while the septum in the majority of cases is normal (10 deformities to 100 in whites). The healthier nose of the negro explains the lesser frequency of pathological conditions in the ear and throat of this race.

Goitre is more prevalent in this city than is generally accepted, 70 cases being here noted. Of these 31 were white and 39 colored.

The larger proportion of impacted wax in the white than in the negro (100 to 24) is explained by the fact that the auricular canal of the negro is usually much larger and straighter than in the white, rendering an accumulation of wax in sufficient abundance to form an impaction more difficult.

An interesting point here shown is the much larger proportion of deaf-mutism in the white, 16 of the 17 cases noted being white. I am not quite certain whether this is due to a special immunity in the negro, or the fact that meningitis in infants, which is so often the cause of this lamentable condition, and other diseases which destroy the hearing in children, are more often recovered from by white children through more careful attention, and who therefore exhibit a larger proportion of this otic sequela.

In primary diphtheria of the nose I note six cases among the whites and none among the negroes. As diphtheria of the throat is shown to be more frequent, in this clinic, in the negro, I cannot suppose it due to the fact that he is exempt, but rather to the circumstance that, as the general symptoms

of primary diphtheritic rhinitis are generally light, the white parent would bring the child to the hospital on account of the obstructed and discharging nostril, to which the negro mother would pay but little attention. The principle here involved might also explain the apparent smallness in the number of certain diseases which we know to be as common, or even more so, in the negro, as for instance lymphadenitis of the neck (87 to 100).

In keloid tumors of the lobule of the ear, we find it seven times more frequent in the negro than in the white. It is found at the site of the pierced lobule, and frequently affects both sides. Turnbull, in his work on the ear, states that it is more commonly found in the mulatto, and that it is due to the scrofulous tendency of this mixed race. This is, however, not my experience, as of the 14 cases which I have seen, 2 were white, 10 were negroes and only 2 mulattoes.

3723 Prytania street.

REPORT OF A CASE OF DOUBLE PEDICULATED
MYXO-FIBROMA.BY C. W. RICHARDSON, M. D.,
OF WASHINGTON, D. C.PROFESSOR OF LARYNGOLOGY AND OTOTOLOGY, COLUMBIAN UNIVERSITY,
WASHINGTON, D. C.

ON June 24, 1893, Dr. Samuel Bogan brought to me for operation a young man having a large growth in his pharynx. The patient was 30 years of age, badly nourished, nervous and anemic. He was a carpenter by occupation. Patient stated that he had noticed the presence of something foreign in his throat for more than a year. He was conscious of the growth, by sight and digital exploration, for about six months. The voice was thick and muffled, many of his spoken words being exceedingly difficult to understand. Nasal breathing was entirely arrested. His brother stated that snoring at night was intense, and this noise, with other sounds made, kept all within hearing distance in a constant state of agitation. There had never been any hemorrhage either from the nasal or pharyngeal cavities. There was no interference with deglutition. On inspection of pharynx a large reddish gray mass was seen protruding from naso-pharyngeal cavity along the inferior border of the soft palate and uvula. The growth extended along the full length of the soft palate from right to left and filled out the space bounded by the soft palate anteriorly and the pharyngeal wall posteriorly. In order to ascertain the point of attachment and determine the extent, size, consistency and nature of the growth I passed my index finger behind the mass into the naso-pharynx. I was very much surprised to find instead of one attachment that the growth had two points of insertion, or two distinct pedicles. One of these pedicles, which was slender, had its attachment to the right lateral wall of pharynx, just above, and anterior to the mouth of the right

Eustachian tube; the other pedicle, firmer and harder, had its attachment to the vault of the pharynx just posterior to the left choanæ. The nasal cavities were quite patulous and presented no deviation from the normal.

From the appearance, soft consistency and freedom from hemorrhage, previous to and during manipulation, I suspected the growth to be a myxo-fibroma. The removal of the growth was easily and rapidly accomplished. Introducing the index finger into the pharynx, it was passed around the more slender of the two attachments which was freed from its insertion to the pharynx.

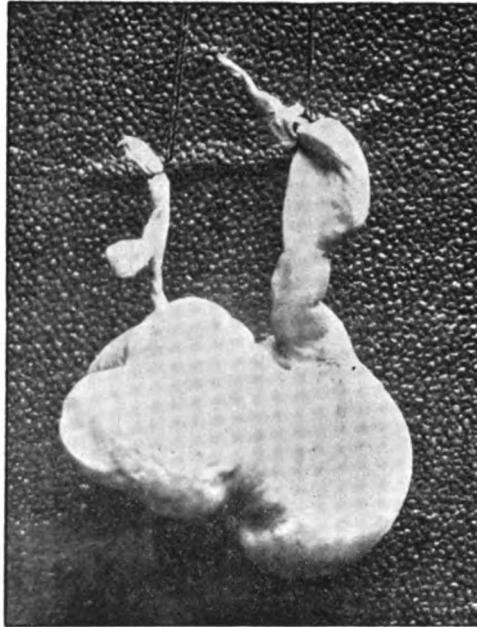


FIG. 1.
Anterior view.

The right half of the growth then fell into the oral pharynx and sagged to the left. A snare was now threaded over the whole mass and carried up into the naso-pharynx, when the whole growth was evulsed. There was very little hemorrhage attending the removal and this quickly subsided. The growth in gross appearance at time of removal was as follows, viz.: its color was pinkish to the right, deepening into a deep red towards the left mass. It was multi-lobular; the right mass being composed of two imperfectly defined lobes, the left of a single lobe, the three

being joined at the common center. The right half had more the appearance and consistency of a true myxoma, the left more that of a true fibroma. The illustrations show the mass.

From the anterior view it will be seen that the lobulated condition of the mass is hardly discernible; a slight contraction above and below giving only a slight idea of the condition as seen by a posterior view. From this view the two pedicles, their points of attachment to the mass, the small growth attached to the slender pedicle, and the outline of the two pedicles are better seen. In

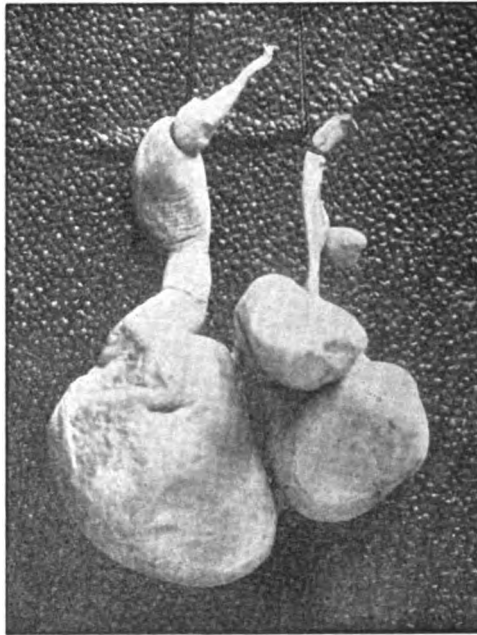


FIG 2.
Posterior view.

the posterior view (Fig. 2) the lobulated condition of the mass is beautifully illustrated. The deep sulcus separating the right and left mass is more deeply marked, by shading, than actually exists in the growth. The bi-lobulated condition of the right mass is, on the contrary, on account of the overlapping of the upper lobe, not so clearly demonstrated as exists in the original. The illustrations were photographed three days after immersion in alcohol and represents its normal size at the time the pictures were made. Pathologic sections of the growth show a predominance of fibrous over myxomatous tissue.

The larger of the two masses was composed almost entirely of fibrous tissue, while the smaller right mass showed a mixed condition, although even in this, the fibrous element predominated at base of growth. The occurrence of large growths in the pharyngeal cavity is decidedly uncommon, I have removed several nearly as large as the one here illustrated and a number of nasal myxomatous growths projecting into post-nasal cavity, but never one presenting such unique features as the growth mentioned above. I regret to report that I neglected to have the growth weighed. I fail to find record of a single instance of a growth removed from the pharyngeal cavity having two distinct and well-marked pedicles. There are probably two ways in which a growth of this character could become possessed of two separate and distinct pedicles:

1. The growth may have started from vault of pharynx, extending along its whole length from right to left, with a web-like attachment which, as the growth increased in size and weight, caused the central part of the web to become attenuated and gradually absorbed, leaving the extreme points of attachment, thus forming the two distinct pedicles.

2. There may have been originally two separate and distinct masses which, as they grew, from inflammatory action or pressure, became attached along their surfaces of contact. Sections were made through the center of this mass from right to left, to determine if there were any histologic evidences of fusion. There was no point under examination but that most positively negated such a conclusion. The growth throughout, so far as possible to discern by the microscope, was a growth with two pedicles.

The interesting features about this growth are:

1. Its double pediculated condition.
2. Its lobulated condition.
3. Its enormous size.

The specimen is now the property of the Army Medical Museum, and is numbered 10,863, pathological section.

1102 L street.

THE ADVOCATION OF A NEW METHOD OF OPERATION FOR MARKED DIFFUSE CARTILAGINOUS DEFLECTION OF THE NASAL SEPTUM.*

BY SEYMOUR OPPENHEIMER, M. D.,
OF NEW YORK.

THE subject of septum deviation is such an important one that I could not do it justice in the few moments allotted me for its resumé and discussion, and particularly as it is more or less a specialistic topic, it might be somewhat out of place at a meeting of this kind. I will therefore confine myself very briefly to those points, directly advancing the method of operation under discussion.

During the past few years, innumerable orthopedic and operative methods for the correction of cartilaginous deviations of the septum of a high degree have been advocated by various operators and authors. The general results of these various methods have been, as far as I learn, far from satisfactory.

In the last year I have operated upon six cases of marked deflection, all due to trauma, in which the greatest portion of the cartilaginous septum was involved. In one I endeavored to correct the deformity by gradual dilatation with bougies, but after several months of perseverance without accomplishing much, the patient became discouraged and passed from under my observation. In three other cases I refractured the septum, and by means of splints held it in position. The immediate results appeared to be very satisfactory, but upon seeing the patients, some eight months subsequent to the operation, I

* Read at the eleventh annual meeting of the Fifth District Branch of the New York State Medical Association, Brooklyn, May 28, 1895.

found that there was a decided tendency for the deformity to return. In the remaining two cases I made a crucial incision, followed by forcible correction of the deflection, and although this procedure did not accomplish all that might be desired, much improvement was derived.

Recently, while in Vienna, I had the opportunity of observing eleven cases of septal deformity operated upon by a method proposed by Dr. Hajek. The results were very encouraging. In all the cases, nasal respiration was established and no external deformity occurred.

During the fall of 1892 and spring of 1893 fourteen cases had been operated upon. In none of these cases had there been any return of the nasal deflection up to the time of examination, December, 1894.

Upon March 24, 1895, A. H., 38 years of age, consulted me, giving the following history: One year previously she was struck upon the nose very forcibly by a baseball. Her physician ordered cold applications and lead and opium solution, under the influence of which the inflammation rapidly subsided, and, excepting for the discomfort of obstructed nasal breathing, she felt comparatively well. For the following six months she had repeated attacks of rhinitis, accompanied with profuse secretion. Consulting a specialist, he made six distinct applications of the galvano-cautery to the right inferior turbinated body at various sittings. His opinion, and also that of a consultant, as to the amount of benefit to be derived from operative interference upon the deflected septum was so dubious, that she decided to postpone it until some future time. Following the cauterization, the nose, which formerly secreted so profusely, assumed a dry condition, with a gradual increasing amount of scab formation, which gave rise to a very disagreeable odor. For this she was again treated, and by the regular use of the spray the nose is kept in a fairly clean state. Upon examination, I find upon the right side an enormous concavity with a marked atrophic condition of the turbinated bodies. Upon the left, the septum is pushed so much laterally that it impinges upon the turbinated bodies, having caused a degeneration of their structure. The entrance of air into this side is practically impossible.

A similar condition of atrophic degeneration was present in the post-nasal space and upon the posterior pharyngeal wall. The patient requesting that something be done for the relief of the nasal obstruction which was developing most unpleasant symptoms, par-

ticularly those referable to aural disturbance, I decided to interfere operatively, but being particularly cautious to inform the patient that I could not forsake the amount of good to be derived.

Upon the following day I operated upon her, the various steps in the procedure being as follows: The nose was disinfected with a spray of a weak creolin solution, also saturating several pieces of cotton with it, which were allowed to remain in position for several minutes. After their removal the posterior nares were plugged, so that there would be no possibility of the blood flowing back into the pharynx during the operation; the patient's attempts at expectoration would have retarded the progress of the operation considerably. Pledgets of cotton saturated with a 10% solution of cocain were then introduced into both nostrils, pressing them firmly against the septum. After ten minutes they were removed, and the parts were found to be thoroughly anesthetized.

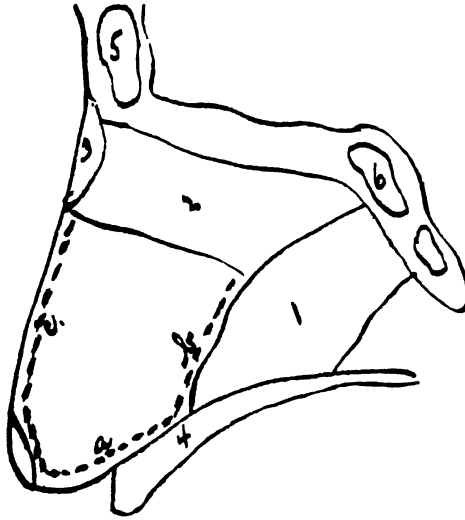


FIG. 1.

Sagittal section of the nose (diagrammatic). A, B, C, lines of incision: 1, vomer; 2, ethmoidal plate; 3, nasal bone; 4, superior maxillary bone; 5, frontal sinus; 6, sphenoidal cells.

An incision (a) was then made with a slender sharp-pointed knife through the antero-inferior border of the cartilaginous septum (through its entire thickness). The incision was continued horizontally backwards and slightly upwards, with a blunt knife, along the juncture of the lower cartilaginous septal border with the spina nasalis of the superior maxilla as far back as the articulation of the vomer.

A right-angular knife was then substituted for the straight one, and the incision prolonged upwards and slightly forwards for about $1\frac{1}{2}$ cm. (b). Then the incision is made from the starting point of the first incision, i. e., antero-inferior septal border, and carried upwards parallel with the external contour of the nose until the lower edge of the ethmoidal plate is reached (c).

These three incisions having been made, the cartilaginous portion of the septum is now converted into a movable fragment, attached only at the upper part.

By using a little pressure the septum can now be dislocated from the convex to the concave side, and held in its new position by some form of splint. The tampons in the posterior nares now being removed, the operation is complete.

Hajek¹ made use of iodoform gauze tampons, which I have replaced by splints, as recommended by Berens.²

Little pain was experienced by the patient and the hemorrhage, although considerable, stopped of its own accord. The splints were left undisturbed for one week, when they were removed and the nares thoroughly cleansed and the splints re-introduced, being allowed to remain in position one week longer, after which they were discarded. •

On April 12, three weeks after operation, the wounds had entirely healed. There was some obstruction due to redundant tissue, occupying the inferior meatus. This was removed by means of the saw. The patient could then breathe freely through the nostril, and the symptoms of aural disturbance, i. e., pain, tinnitus, deafness, which previously existed, have entirely disappeared. The knives used for the operation were made after the models of Prof. Jurasz,³ of Heidelberg, their original intention being for resection of the septum.

¹ Hajek, *International Klinische Rundschau*, No. 38

² *Manhattan Eye and Ear Hospital Reports*, 1894.

³ *Die Krankheiten der oberen Luftwege*, page 70.

55 East Sixty-fifth street.

TRANSLATIONS FROM CURRENT FOREIGN LARYNGOLOGICAL LITERATURE. (ABRIDGED.)

By J. W. GLEITSMANN,
OF NEW YORK.

AUTOSCOPY OF THE AIR PASSAGES (INSPECTION WITHOUT LARYNGEAL MIRROR).

Dr. Alfred Kirstein (*Therapeutische Monatshefte*, July, 1895).

This paper is the last one of the series of publications upon the same subject. The other papers have been as follows:

1. *Laryngoscopia directa und Tracheoscopia directa (inspection of the larynx and trachea without mirror)*. Preliminary communication (*Allg. Med. Central Zeitung*, 1895, No. 34).

2. *Autoscopy of the Larynx and Trachea with demonstrations*. Paper read before the Laryngological Society of Berlin, May 15, 1895 (*Berl. Klin. Wochenschrift*, 1895, No. 22).

3. *Autoscopy of the Larynx and Trachea with demonstrations*. Paper read before the Laryngological Society of Berlin, May 24, 1895 (*Archiv. für Laryngologie und Rhinologie*, Vol. III, No. 1 and 2).

4. *Autoscopy of the Larynx and Trachea*. Meeting of the South German Laryngologists at Heidelberg, June 4, 1895.

5. *Progress in the examination of the Pharynx and Larynx without mirror (Autoscopy)*. Preliminary communication (*Allg. Med. Central Zeitung*, 1895, No. 44).

6. *My improved method of Autoscopy of the Air Passages*. (*Allg. Med. Central Zeitung*, 1895, No. 51).

Kirstein in his last publication describes at length his improved method of autoscopy, namely: The direct inspection of the larynx and trachea without the aid of the laryngeal mirror. When we compare this present method with previous procedures, a considerable progress in the construction and application of the instrument is obvious.

The instrument called autoscope consists of a straight, slightly concave metal plate about five inches long and one inch wide, resembling somewhat a straight tongue depressor. At the end near the handle a rectangular sliding plate is to be attached leaving sufficient space between the two plates for inspection and introduction of the instrument if so desired. The distal end is round, slightly concave, and thickened to prevent injury to the part coming in contact with the instrument.

After the sliding plate has been attached to the horizontal one the latter is inserted into the opening of the handle bearing an electric lamp (Casper), and when connection with a battery has

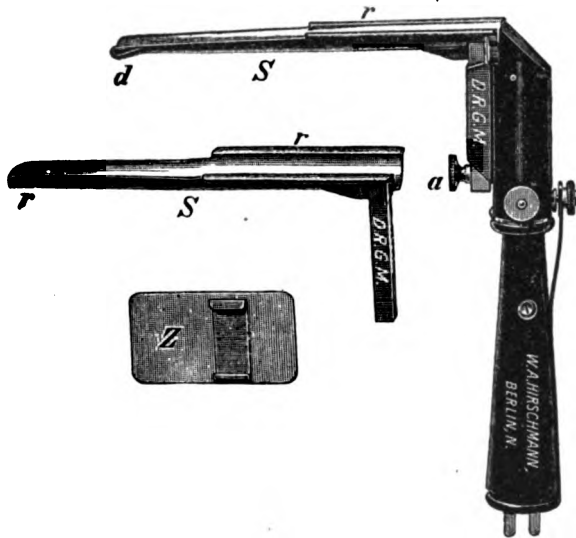


FIG. 1.

been made the autoscope is ready for use. The latest improved set furnished by Kirschmann, of Berlin, also contains a metal handle which is to be utilized for the forehead reflector; it is used with gas or preferably with electric light.

According to the position of the autoscope we distinguish three different periods of the examination.

For the first position (pharyngoscopy) the physician stands in front of the patient, who is sitting upright on a chair, and introduces the illuminated autoscope into the mouth in the same manner as in applying the ordinary tongue depressor. When the tongue has been depressed the usual picture of the pharynx is seen.

For the second position (autoscopy of the lower portion of the pharynx) the instrument is pushed farther back, the handle elevated

whilst the tongue is steadily depressed. We may now see the whole anterior surface of the epiglottis, both valliculæ, the entire posterior and lateral portion of the pharynx, and occasionally the arytenoid cartilages and the sinus pyriformis.

For the third position (autoscopy of the larynx and trachea) the handle is still more elevated till the rectangular plate approaches or comes in contact with the upper teeth. Pressure against the teeth should be avoided, and under no circumstances ought the



FIG. 2.

teeth to be used as leverage. The base of the tongue is pushed downwards and forwards and pressure exerted with the autoscope against the glosso-epiglottic ligament to raise the epiglottis. One may then inspect the entire surface of the posterior pharyngeal wall, the pyriform sinuses, the arytenoid cartilages, Santorini's cartilages, the ary-epiglottic folds, the posterior surface of the epiglottis, the ventricular bands and the vocal cords.

In order to examine the trachea, the patient must lean forward, to bring the axis of the trachea into line with the axis of the buccal

cavity. Besides the pharynx and larynx, the whole trachea, with the bifurcation and the beginning of the bronchi can then be seen.

While changing from the first to the third position, all jerking movements must be avoided. The whole examination requires only a few seconds, and Kirstein claims that it is to many patients less disagreeable than the introduction of the laryngeal mirror.

If the patient is too irritable at the first insertion of the auto-scope, the examination ought not to be carried on by force, but careful attempts must be made to accustom the patient to the instrument. Should it be impossible to do so, the irritability can be alleviated by the use of cocain. Another obstacle to this method may be the fact that the epiglottis cannot always be sufficiently elevated by the pressure of the autoscope upon the base of the tongue. In such cases cocain must be used, and the auto-scope placed behind the epiglottis. For this purpose horizontal plates with a flat smooth end have been constructed.

The writer had occasion at a recent visit to Berlin to witness the examination of patients made by Dr. Kirstein. While it cannot be denied that the examination is accompanied by a disagreeable feeling—especially to the writer himself when his own larynx was examined—it must be said that the image of the part is as beautiful as it is surprising, and when examination is successful, all the parts described above can be seen to the fullest extent.

ABSTRACTS FROM CURRENT RHINOLOGICAL AND
LARYNGOLOGICAL LITERATURE.BY M. D. LEDERMAN, M. D.,
OF NEW YORK.

PHYSIOLOGY AND ANATOMY OF THE NOSE.

Dr. G. Scheff (*Inter-Colonial Quarterly Journal of Med. and Surg.*, Vol. II, No. 1). The author bases his conclusions from experiments carried out upon the cadaver and casts representing the internal structure of the nose. He states that the greater part of the current of air finds its way through the middle meatus; that the old division into respiratory and olfactory regions, is not physiologically correct. In normal respiration, perception of smell takes place. The act of sneezing can have some action upon the contents of the accessory cavities. The middle meatus is the only wide and unobstructed passage for the current of air.

RECURRENT NASAL FIBROMA.

Dr. Price Brown, Toronto (*The Canadian Practitioner*, Vol. XX, No. 8). This growth presented itself in a male, 22 years of age. At the recorder's first examination it was found about an inch and a quarter from the anterior nares, right side, filling the passage, springing from the septum, the vault above, and the middle turbinated body. The attachment on the septal side extended down to the floor of the inferior meatus. The patient was a hemophilia. He had been operated upon a number of times before reaching the author. The previous operator had diagnosed the condition as sarcoma. Under cocain (20% solution), Dr. B. attempted to remove the tumor by means of the galvano-cautery knife, through the anterior nares. Incisions were made on both sides of the growth (septal and external borders), but the hemorrhage was quite severe, and tampons had to be employed to stop

the bleeding. One of the incisions, through the central portion of the mass, laid bare an artery, which seemed to run across between the septum and the external wall. Anterior packing controlled the hemorrhage for a time, but it reappeared, and posterior plugging with sponges soaked in a combination of tannic and sulphuric acid, was effective. The patient was pulseless for a time, but after a week in bed, and two more weeks' rest, the treatment was continued. Electrolysis was then tried, in the hope of limiting the severity of future hemorrhages. After this treatment, the cautery was applied at sixteen different sittings without causing annoying bleeding. The growth extended backwards to the anterior margin of the Eustachian tube; and forced the soft palate downwards. The posterior portion was the most difficult to get at. Daily cleansing with alkaline sprays, followed immediately by the removal of the crusts, and applications of albolene was the supplementary treatment. The patient made a good recovery. Two microscopical examinations showed the growth to be a dense, close-grained fibroma.

MULTIPLE BENIGN PAPILLOMATA OF THE BUCCAL MUCOUS MEMBRANE.

Rasch, of Copenhagen (*Edinburgh Medical Journal*, August, 1895), reports two cases, where a number of grayish-red, warty or condylomatous growths were found on the inner side of the lower lips and cheeks, varying in size from a linseed to a lentil. The larger bled easily when touched or during mastication. Applications of Paquelin's thermo-cautery cured the disease. In one of the cases, the child was in the habit of sucking her thumb, on which she had an old-standing wart. In instances of papillomatous growths of a simple kind, of the nose, epiglottis, and larynx, the author suggests that the hands of the infants and nurses should always be inspected.

TUBERCULOSIS OF THE UPPER AIR PASSAGES.

Dr. Jonathan Wright, Brooklyn (*New York Medical Journal*, Vol. LXII, No. 12). In discussing the etiology of this disease, the author expresses the opinion that the three "postulates of Koch" have been discarded. To us, as clinicians, tuberculosis means the tubercle, the tubercle bacillus, "plus the vital energy of the bacillus on the one hand and that of the resisting human organism on the other." He thinks that there is some special local resisting

power existing in the nose and throat, which prevents the bacillus from entering the system. Furthermore, that there exists a special local annihilating influence upon the bacillus after it has gained an entrance into the mucous membrane. If such were not the case, primary pharyngeal and laryngeal tuberculosis would be a frequent manifestation. Thost claims that the bacillus frequently enters by way of the glands, in whose epithelium the tubercle frequently develops. Other observers, however, deny this statement. [That some local protecting agency exists seems rational, for authorities have cultivated the bacillus from healthy mucous membranes, and were this resisting power absent, the individual would, no doubt, become a tubercular subject. M. D. L.]

In a drawing of a section of an infant's larynx, the author demonstrated that the columnar epithelial structure did not snugly fit the cartilaginous framework of the larynx. There was loose areolar tissue beneath, which permitted extensive movements of the lining membrane, without causing a break in the continuity of the epithelial layer. This, he claimed, was a provision of nature to prevent the entrance of micro-organisms.

EXPERIENCES WITH PAQUIN'S ANTI-TUBERCLE SERUM IN THE TREATMENT OF LARYNGEAL TUBERCULOSIS.

Dr. H. W. Loeb, St. Louis (*New York Medical Journal*, Vol. XLII, No. 14). After observing decided results from the use of this serum in cases of pulmonary disease; the author administered same in nine cases of laryngeal disease. He records the detailed histories of these cases. In one of the cases mentioned, the patient, a male, 34 years of age, refused any local treatment, but permitted the injection of the serum. This case improved considerably. His condition before the treatment was serious. Both lungs were markedly affected, together with pronounced laryngeal involvement. A dubious prognosis was given, and patient was started with one cubic centimeter of the serum daily. The dose was gradually increased until four cubic centimeters were given subcutaneously. No other medicine had been employed in this instance. After a time, the laryngeal lesions improved, and the lungs cleared up considerably. As the serum was the sole agent applied in this individual case, the author is inclined to believe that it has shown a decided beneficial action.

All the other cases reported had pulmonary tuberculosis, complicated by laryngeal disease. In some of them local treatment

was added to the serum injections. These unselected cases exhibited a more favorable course under this treatment than under any other previously tried.

AN EXTREME CASE OF ANGINA LUDOVICI ARISING FROM AN INFLAMED TOOTH.

Dr. E. P. Hughes, Sheffield (*The Journal of Laryn., Rhin. et Otol.*, Vol. IX, No. 7). The infection originated from a diseased tooth in a male patient, 31 years of age. Toothache had existed for ten days. On examination the front of the neck was swollen, hard and brawny, not pitting on pressure. He was unable to swallow or speak above a whisper. The swelling extended from the angle of the jaw downwards and forwards to the third costal cartilage; the jaw was fixed, and the tongue forced into the roof of the mouth. An incision was made in the median line from the symphysis to the lower border of larynx; no pus was found. During the surgical interference symptoms of collapse appeared, and though tracheotomy was performed and artificial respiration applied, the patient was not revived.

TRIGEMINAL NEURALGIA AND NASAL DISEASE.

Dr. Mayo Collier (*The Lancet*, 1895, Vol. II, No. 3757). Two cases of severe and persistent facial neuralgia which had resisted all treatment are reported cured by removal of diseased middle turbinated tissue. In one case the neuralgia had existed four years, and in the other the troublesome symptoms had been present off and on for twelve years. The neurotic disorder was evidently due to some irritation affecting the nasal ganglion on the second division of the fifth nerve.

THE ETIOLOGY OF NERVOUS POLYPI OF THE NOSE.

(*British Medical Journal*, 1895, No. 1808). In a discussion before the Laryngological Section of the British Medical Association held at London, July, 1895, upon the causation of nasal polypi, Dr. Luc, of Paris, stated that he could not accept the necrosing ethmoiditis theory, of Woakes. He had operated upon cases from polypi, with portions of the middle turbinated, had been removed, and the latter had been carefully examined microscopically without revealing the slightest sign of inflammation of the bone. At this meeting he showed microscopical specimens of

the disease under discussion in which no pathological modification of the bony structure could be observed. With such evidence he claims that myxomatous degeneration may be completely independent of any lesion in its neighborhood. It may, however, be the result of repeated or protracted nasal catarrhs, though such a pathogenic relation cannot always be ascertained. Myxomatous degeneration, he is inclined to believe, is most frequently associated with chronic suppuration of the accessory sinuses, or of the nasal fossæ themselves. In some instances malignant diseases of the nose plays a pathogenic rôle.

Professor Dr. Zuckerkundl, of Vienna, in discussing the subject arrived at the conclusion that Woakes' theory is incorrect and untenable. He stated that the hypertrophy of the bone which is sometimes found at the base of the polypi is due to the inflammatory condition of the mucous membrane, whose deeper layers take the place of the periosteum. When the superficial layers become congested and hypertrophic, the deeper, periosteal layers may also become affected and thus cause hypertrophy of the bone.

Dr. P. McBride, of Edinburgh, reasoned that gravity is an important factor in the production of polypi, and that in a certain proportion of cases, inflammatory changes alone may be the starting point of the disease. He claims that pendulos polypi are rarely seen arising from the inferior turbinated body, while on the other hand, papillary growths are more frequently seen in this vicinity. He thinks that the statement of Grünwald and others as to accessory sinus disease being the principal causative factor in this affection is too sweeping, and must be accepted with caution.

PROFESSIONAL NEWS.

Dr. Will Walter, of Marquette, Mich., is recuperating at Ocean-side, San Diego County, California, and preparing to put in a lemon grove.

Dr. J. E. Bradbury has removed from Rockland, Mass., to Taunton, Mass.

Dr. Lester E. Schoch has removed from Shamokin, Pa., to Reading, Pa.

Dr. Thos. F. Rumbold, whose original work in Rhinology has made his name familiar on both sides of the Atlantic, has returned from San Francisco to his old home in St. Louis much improved in health.

At the twenty-seventh annual meeting of the Minnesota State Medical Society, which convened in the city of Duluth, June 20, 1895, Dr. Frank Allport, of Minneapolis, was elected president of the society for the ensuing year by a unanimous vote.

The Eye and Ear Hospital of Pittsburgh, Pa., opened its doors to patients the first day of last July. Drs. Jos. E. Willetts and C. A. Wishart are the ophthalmic surgeons in charge. Dr. E. W. Day is the aural surgeon, and Dr. E. G. Matson is the histologist.

It is not uncommon to receive letters from physicians stating that they "subscribed for the ANNALS OF OPHTHALMOLOGY AND OTOTOLOGY through an agent months ago and have not received a single copy," and when the matter is looked up it is found that the subscription has never been received. The latest communication of the kind comes from Dr. W. H. Snyder, of Toledo, Ohio. The doctor subscribed through one H. H. Grady, agent for "The Consolidated Book Co.," 133 Vanderwater Street, New York City. Dr. Snyder sent to the editor of the ANNALS the signed

contract that he received from the agent (H. H. Grady) of "The Consolidated Book Co.," and it appears worthy of notice as other physicians are likely to be visited by the agent, and it has been found that "The Consolidated Book Co." is unknown in New York. Vanderwater Street is a very short street on which the numbers run from 1 to 42 only, and there can be no such a number, as given, on the street, and no such a concern as "The Consolidated Book Co." is listed in any of the New York City directories. The handsomely printed blanks, cards and letter heads of such concerns catch the eye, but it is to be hoped that no other physicians will be caught. Arrangements have been made to "surprise" the readers of the ANNALS, next year, by producing a \$10-publication for the subscription price of \$5, and all subscribers will get the best results by sending \$5, Postoffice Money Order, direct to

JAS. P. PARKER, M. D.
701 Olive Street,
ST. LOUIS, MO.

FOR SALE OR EXCHANGE.

Dr. Wendell Reber, of Pottsville, Pa., has volumes X, XI and XII of the *Archives of Otology* (bound), and volumes XIII to XIX, inclusive (unbound), which he would be willing to sell or exchange for the following volumes of *Archives of Ophthalmology*, I to X inclusive, and XX, XXI and XXII.

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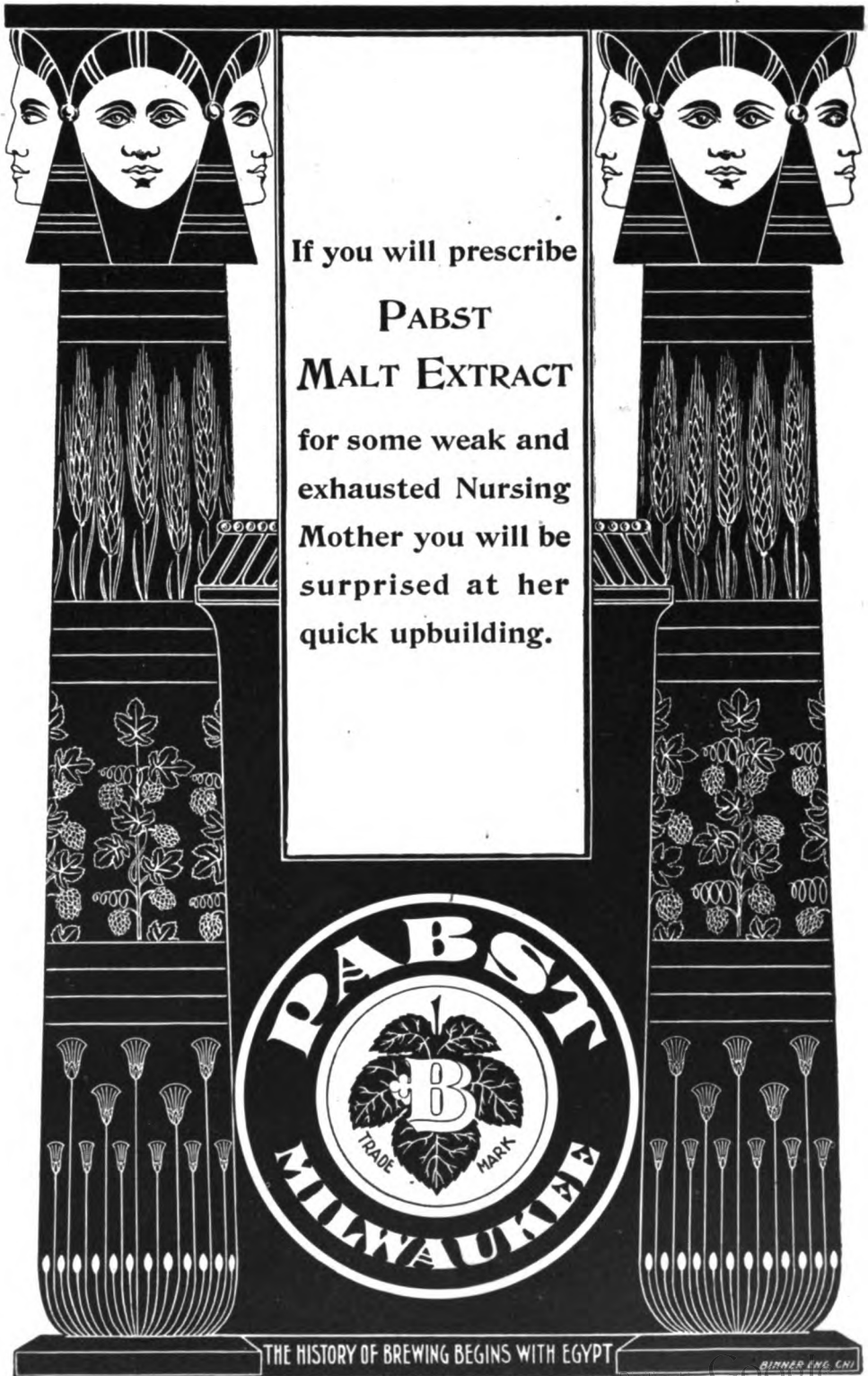
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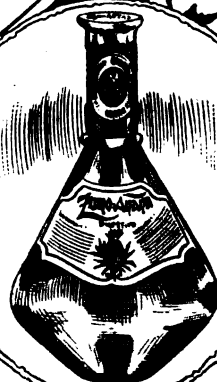
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